



United States Department of Agriculture

Green Horse Project

Environmental Assessment



Forest Service

Nez Perce-Clearwater National Forests

Moose Creek Ranger District
February 2021

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This Environmental Assessment conforms to the procedural regulations for the implementation of the National Environmental Policy Act (NEPA) at 40 CFR sections 1500 to 1508, published by the Council on Environmental Quality (CEQ) in 1978. The CEQ issued revised regulations for these procedural requirements, effective September 14, 2020. The revised regulations provide the responsible project official the option of conducting an environmental analysis under the 1978 regulations if the process was initiated prior to September 14, 2020. Because this project was developed and scoped prior to September 14, 2020, the responsible official has elected to follow the 1978 procedural requirements for NEPA.

Project Location

The Green Horse project is located on the Moose Creek Ranger District within the Nez Perce-Clearwater National Forests. The project area is located in Idaho County approximately 10 miles north-northeast of Elk City, Idaho (Figure 1).

The Green Horse project area encompasses approximately 9,500 acres in the O'Hara Creek, Glover Creek-Selway River, Horse Creek, and Upper American River watersheds that drain into the Selway River or South Fork Clearwater River. The main road access to the project area is via Forest Road 443 from the south and Forest Road 464 from the west of the project area (Figure 2).

The legal description for the project area is (township, range, sections):

- Township 31 North, Range 8 East, Sections 4, 9-16, 20-29, 35, and 36;
- T. 31 N., R. 9 E., Sections 7, 8, 19-20, 28, 33

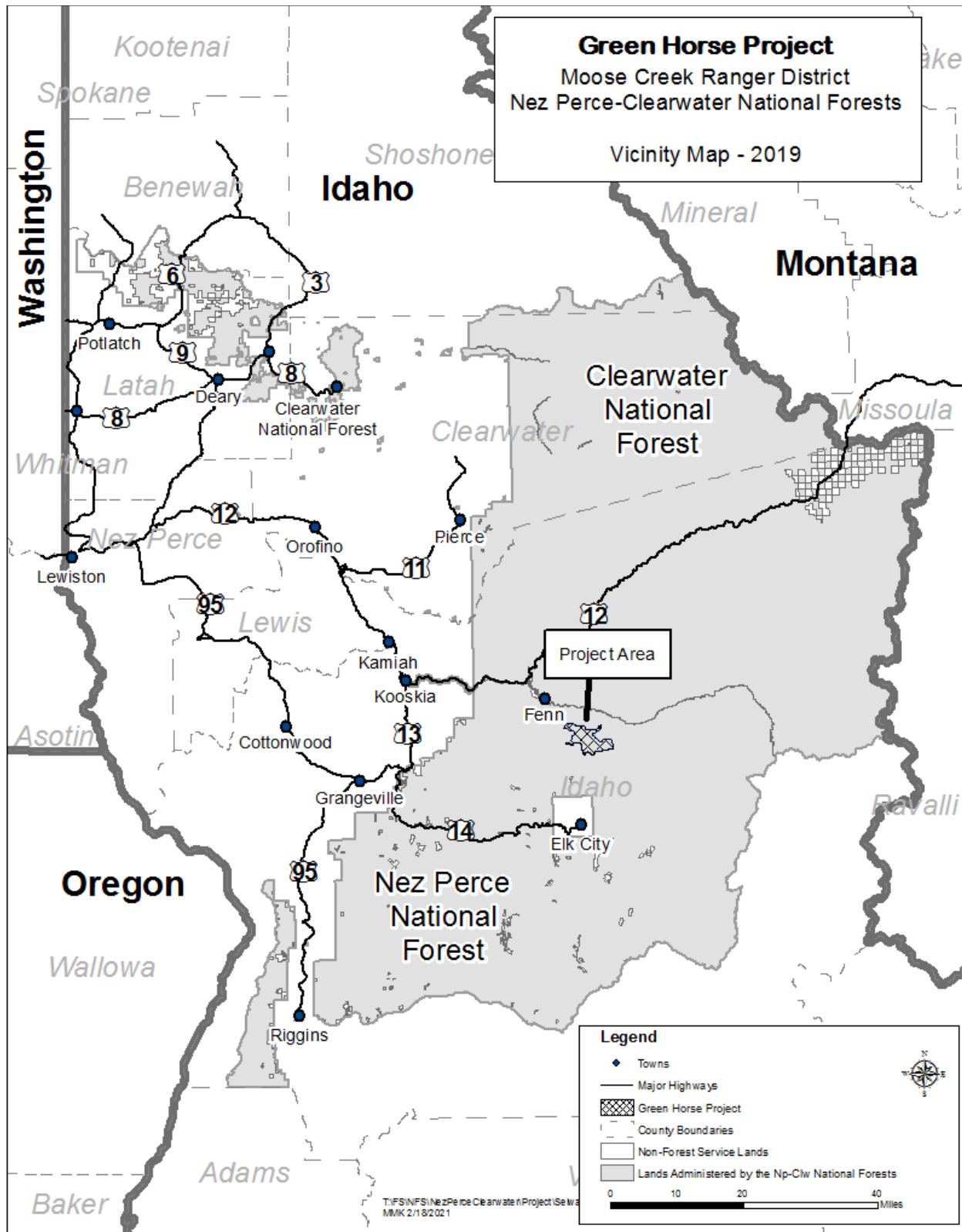


Figure 1. Vicinity map of north central Idaho, Nez Perce-Clearwater National Forests, and the Green Horse project area.

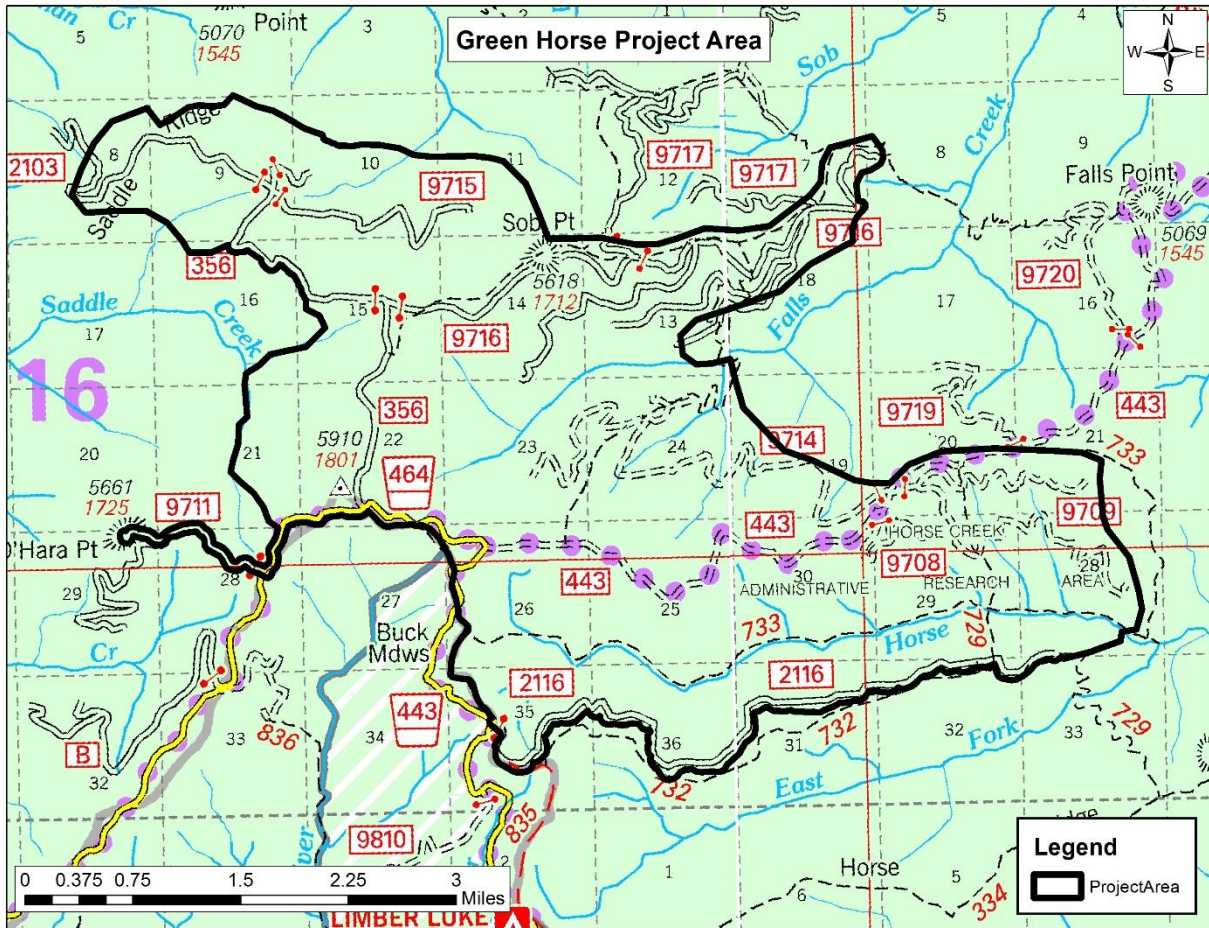


Figure 2. Map of Green Horse project area

Project Background

The Green Horse project is part of the larger Selway-Middle Fork Clearwater Collaborative Forest Landscape Restoration Proposal. In 2010, the Clearwater Basin Collaborative (CBC) in partnership with the Nez Perce–Clearwater National Forests produced a comprehensive restoration strategy that was submitted for funding through the Collaborative Forest Landscape Restoration Program. This science-based proposal was designed to restore and maintain ecological conditions within the 1.4-million-acre Selway–Middle Fork ecosystem in Idaho. Although the funding provided by the Collaborative Forest Landscape Restoration Act ended in September of 2019, the Green Horse project was developed to be consistent with the goals of the proposal as well the desired conditions in the Selway-Middle Fork Clearwater River Subbasin Assessment (USDA 2001) and the Nez Perce National Forest Land and Resource Management Plan (USDA 1987). The project was also developed using the goals and objectives of the Idaho County Natural Resources Plan that include hazardous fuel reduction, forest health, timber production, firefighter safety, and economic stability (ICNRP 2016).

Public Involvement

The Green Horse project area is within an area on the Nez Perce–Clearwater National Forest that has been affected by the western hemlock looper. Forest Service employees working in silviculture and forest health monitored the looper outbreak and studied impacts to trees on the Nez Perce–Clearwater and other public lands in the region to decide what management actions are most appropriate. Only trees with

severe defoliation from the loopers are at risk of dying - trees with less vegetation loss are likely to rebound from the outbreak

(<https://www.fs.usda.gov/detailfull/nezperceclearwater/home/?cid=FSEPRD664804&width=full>). As project development continued, site visits determined that the amount of defoliation from the western hemlock looper was less than originally estimated from the aerial detection surveys. On-going monitoring showed levels of hemlock looper in decline across the Forest (Malesky et al. 2020).

Public outreach about the western hemlock looper began during late summer and into the fall of 2019. A community meeting took place in Elk City, Idaho where community members invited Forest Service staff and a presentation about the looper was given and community members inquired about the tree mortality and defoliation appearing across the landscape, natural controls for suppression of the looper, and projections for next year. An introduction about the project was provided to the Board of Idaho County Commissioners and The Green Horse project was presented at a public meeting held by the Clearwater Basin Collaborative. Forest Service also provided a presentation to staff from the Nez Perce Tribe on the looper as well.

A proposal for the Green Horse project was listed in the quarterly Schedule of Proposed Actions on January 1, 2020. The proposed action was provided to the public and other agencies for comment during a combined scoping and 30-day comment period beginning with a legal notice published in the Lewiston Morning Tribune on February 22, 2020. In addition, as part of the public involvement process, the agency also presented the project at a public meeting held by the Clearwater Basin Collaborative in Kooskia, Idaho on January, 29, 2020.

Need for the Proposal

Based on observed existing conditions, as well as other supporting information (e.g. annual insect and disease aerial detection surveys, national insect and disease risk maps, input from local community members, Forest Plan management direction), there is a need to:

- Improve forest health and provide a sustained yield of resource outputs as directed in the Forest Plan by:
 - Reducing the extent of insect and disease infection and
 - Altering species composition to include more early seral species that are less susceptible to disease infection.
- Reduce hazard trees, hazardous fuels, and wildfire risk:
 - Along roads for public and firefighter safety, including ingress/egress;
 - To protect timber resources; and
 - To maintain recreational opportunities within the area.

Alternatives Considered in Detail

No Action

Under No Action current management plans would continue to guide management of the project planning area. No silvicultural treatments or road activities would be implemented to accomplish project goals.

This alternative provides a baseline for comparison of the environmental impacts of the Proposed Action to the existing condition and is a management option that could be selected by the Responsible Official. The results of taking no action would be the current condition as it changes over time due to natural processes. Taking no action responds to public comments that expressed a desire for no management actions.

This alternative would continue the standard resource protection and recurrent maintenance activities such as access management and routine scheduled road maintenance that are currently ongoing in the project

area and directed by the Nez Perce National Forest Land and Resource Management Plan. Ecosystem processes such as vegetation succession would continue their current trends. Taking no action would result in the following:

- Species composition would remain predominately late-seral, shade-tolerant species. The current diameter distribution would slowly change as shade tolerant trees species would continue to grow in the understory, and larger trees would continue to grow into the next larger size class. Susceptible trees (grand fir, subalpine fir, and Douglas-fir) would continue to succumb to root disease, leaving openings in the canopy but the persistence of root disease within the stand would hinder successful regeneration. Large tree size-classes would decrease, and mortality would increase existing fuel loads.
- Types of old-growth that could be achieved on these sites with current species composition would be limited due to root disease becoming more prevalent.
- Fuels condition would not be altered in a way that reduces fire behavior. Wildfire would still be allowed to play its natural role where appropriate and desirable but would be suppressed where necessary to protect life and resources. The continuity and density of canopy within the project area would not be altered and it would remain at similar levels or slightly increase from that described in existing conditions. Hazard trees along road systems would remain which would continue to be a safety concern for public and firefighter's safety. In the absence of any kind of human-caused or natural disturbance, the forest would change with natural progression and growth. Wildfires that escape initial attack are likely to become large and damaging. Direct fire suppression tactics would not be as effective as compared to the proposed action. Fire risk in the project area would likely increase and contribute to wildfires that could become more difficult and more costly as conditions worsen with time.
- There would be no additional effects on potential rare plant habitat, as compared to past activity levels. The progression of forest succession would improve habitat for most sensitive plant species. However, the decline of successional tree species due to competition, disease or insect-caused mortality may cause localized openings and increases in light and fuel loads, which could lead to more intense wildfires and resource damage. In such cases, older habitat favored by these plant species could see localized declines, but the trend overall would be one of increasing habitat suitability. Conversely, species favored by more open conditions would decline as general forest succession progressed absent of large-scale disturbance such as wildfire.
- Weed management strategies would continue by managing with a high-priority/eradicate-objective within the project area. Herbicide applications would remain at current levels in the short-term but would increase in the long-term. Plant succession that would move the area toward more dense stands with multiple canopies in forested habitat type groups and decrease the rate and spread of weeds until stand replacement fires occur.
- Under current management, range condition and trend are expected to remain stable, followed by a slow decline resulting from loss of forage availability due to conifer encroachment, and loss of transitory range.
- There would be no impact to bighorn sheep, flammulated owl, fringed, long-eared, and long-legged myotis; North American wolverine, western toad, neotropical migratory birds, American marten, northern goshawk, pileated woodpecker, and Shiras moose or to these species habitat; ongoing disease outbreaks and future wildfires would continue to provide habitat for the black-backed woodpecker; current conditions of fisher mature habitat and fragmentation staying the same; reduced browse available to elk would likely adjust wolves location to where the elk are present for prey; without a fire or other disturbance, the shrub component would decline under the developing tree canopy and forage for quail would decrease.
- No effects to the soil resource would occur and the existing condition would be maintained.
- There would be no increases over natural sedimentation or increases to water yield from proposed actions; therefore, there would be no effects to water resources.

- The existing condition would be maintained, existing roads may continue to contribute sediment to streams and this risk is considered low for aquatic species habitat.
- No Action would not generate any positive values so the net value would be zero.
- Dead and dying trees within falling or striking distance of roads would continue to fall and block Forest system roads. This maintenance action would not occur and forest infrastructure would be at risk. Lack of maintenance could render infrastructure in less than safe conditions and may result in closure of roads and trails in the future. Natural processes would continue, no action could ultimately lead to an increase in the evidence of timber cutting adjacent to the roads, either from firewood gatherers, the public maintaining access or Forest personnel needing to maintain administrative access affecting the natural integrity and undeveloped character of the O'Hara-Falls Creek and West Meadow Creek roadless areas; a lack of road maintenance would limit access to the existing opportunities for primitive and unconfined recreation that would affect the outstanding opportunities for solitude or a primitive and unconfined type of recreation for these roadless areas; there are Special Features or Values and taking no action would not affect the manageability of the O'Hara-Falls Creek and West Meadow Creek roadless areas as future wilderness areas.

Proposed Action

The Forest Service is proposing a suite of activities to meet the need for the proposal described above. The timber harvest activities described below may begin during the summer of 2022 and occur over approximately the next 12 years; landscape burning would follow and would occur over approximately the next 20 years; with subsequent maintenance burning occurring every five to ten years. A description of these activities follows.

Silvicultural Treatments

Regeneration harvest (approximately 1,510 acres): Regeneration treatments would primarily remove disease-susceptible species, as well as currently dead or dying trees. Retention requirements will be dependent upon other resource needs (wildlife, visual, soils, hydrology) and would first be met by untreated ground that is within riparian habitat conservation areas (RHCAs), including field-verified landslide prone soils; and areas where harvest system limitations prevent treatment (see p. 15). Retention could also be clumped across the unit where needed for wildlife or other resource objectives. This retention pattern will provide visual irregularity across the landscape. Where treatment units intersect with dispersed sites, coordination with interdisciplinary team members will occur to retain, where it exists, a healthy forested appearance within current dispersed site perimeters.

Disease resistant early seral species would be given preference for retention; other species may be retained to meet other objectives or where early seral species are not available, provided that the trees are relatively free of insect and disease. If Pacific yew is present in the understory, it should be considered for a retention clump or patch for wildlife. Snags retained for wildlife purposes would be the largest diameter possible that did not pose safety concerns during any phase of treatment.

Some regeneration units would be roadside units to treat fuels up to 150 feet off the road to provide a fuel break along system roads for public and firefighter safety. Priority would be to remove dead and dying, along with shade-tolerant insect and disease susceptible species, to provide safe ingress/egress for the public and firefighters. Any untreated roadside areas within planned unit boundaries and other untreated roadside areas that are no longer than one quarter mile (¼ mile) in length and lie between two treated areas would count toward required retention values. All roadside units will be considered fully stocked at lower-than-average densities as a result of safety and hazard concerns.

There would be no harvest in riparian areas, including field-verified landslide prone areas; or verified old growth. In order to minimize soil disturbance, legacy skid trails will be reused where possible, and rehabilitated as described in the Standard Design Features (document 11-004). In units 02A and 03A, a

minimum of 0.5 miles of legacy skid trails will be reused and subsequently rehabilitated in each unit in order to maintain soil productivity and comply with Forest Plan soil standards.

Some proposed units would create openings that are greater than 40 acres (Table 1). Direction in Forest Service Manual 2470, Region 1 Supplement #R1 2400-2016-1, Section 2471.1 states that the size of openings created by even-aged silvicultural treatments in the Northern Rockies will normally be 40 acres or less, with certain exceptions. Areas where opening size exceeds 40 acres would be in areas where treating less than 40 acres will not result in the desired outcome of treating the extent of the insect and disease within the treatment unit. It should be noted that opening size may be smaller than the analyzed unit due to harvest systems limitations, retention requirements, and riparian or landslide prone buffers. Proposed units larger than 40 acres that are not on the list (Table 1) will not have contiguous openings greater than 40 acres.

Table 1. Proposed regeneration harvest units that are larger than 40 acres that may result in openings greater than 40 acres

Opening No.	Unit No.	Acres
1	1	47
2	2	48
3	3	53
4	9	56
5	10	142
6	11	45
7	16	46
8	17	406
9	18	51
10	23	63

Site preparation (1,510 acres): Activity-generated fuels would be treated to prepare for reforestation within regeneration harvest units. Site preparation may include broadcast or jackpot burning; hand piling or mechanical piling and burning; or mastication of activity-generated fuels on slopes less than 35% and on ground that is machine operable. Broadcast or jackpot burning may be allowed to burn outside of units depending on site conditions, to meet resource needs and project objectives.

Reforestation and animal damage control (approximately 1,510 acres): Reforestation would focus on restoring long-lived early seral species such as ponderosa pine, western larch, Douglas fir, and lodgepole pine. Other species that may be planted include Engelmann spruce and western redcedar, where appropriate. Roadside harvest units would be planted at lower densities to maintain a more open stand for public and firefighter safety.

Within the grand fir-dominated sites, there is the potential for up to 50% of the proposed harvest units to be in an ecosystem that may require site-specific adjustments to the prescription to ensure adequate reforestation (Ferguson & Byrne, 2000; Ferguson et al. 2005). Adjustments could include different site preparation methods, two years of gopher baiting treatments, planting at higher densities and/or weed and release treatments to ensure adequate reforestation within 5-year reforestation timelines. Past records show 5-10 year reforestation timelines, with an 82% rate of successful reforestation of all harvested acres on the Moose Creek Ranger District (document 17-002).

In order to limit damage to conifer seedlings, pocket gopher control is proposed in regeneration harvest units where necessary to control gopher populations. Rodenticide (Strychnine Oats — Hand Baiting; EPA Reg. No.56228-20) would be applied at the lowest effective rates below ground into gopher burrows at selected sites. Application rates are typically 1/8th to 1 lb. of bait per acre; however, it can be as much as 2

pounds per acre in heavily impacted stands. Treatments should be suspended when soils are wet or when heavy rain is predicted.

Intermediate Harvest (approximately 180 acres): Salvage harvest along Forest Roads 2116, 464, 464-A, 356, and 2013 that are located on borders of the O'Hara-Falls Creek and West Meadow Creek roadless areas is proposed to remove dead and dying trees (approximately 9.4 miles and 180 acres) within falling or striking distance of improvements and/or the road (pose a hazard to the road). Retention would vary across units and be dependent upon the amount of dead and dying hazard trees within the unit. Areas with little-to-no mortality would have higher amounts of retention, while areas of high mortality will have lower areas of retention.

Activity fuels may be treated to remove excess fuels through hand-or-machine piling; and then burning the piles, or mastication of activity-generated fuels on slopes less than 35% and on ground that is machine operable.

Ground-based (tractor) and cable/skyline harvest systems would be utilized to accomplish harvest. Ground-based skidding would be limited to slopes less than 45 percent and skyline logging systems would be used in areas with steeper slopes (Table 2).

Prescribed burning (approximately 570 acres): Prescribed fire goals are to mimic the characteristic fire regime and allow progress towards the restoration of ecological processes to help maintain current fire regimes, transition to historic fire regimes, and to enhance ecosystem resiliency (Noss et al. 2006). The objectives of prescribed fire in these landscape burns are to maintain natural openings, reduce surface fuels, litter depth, and ladder fuels; increase canopy base height (the distance from the ground to the bottom of the tree canopy), and provide a fuel break in strategic locations along Forest Roads 356 and 9716 for wildfire management in the future for public and firefighter safety. The intent of ignition is to achieve the objectives described above with a mix of low-and-medium-intensity surface fire. Some individual or group torching of trees may occur in the units, creating a mosaic of burned/unburned vegetation. Areas of overstory tree mortality would be expected up to approximately 3 years post-burn. The burning of natural fuels may occur more than once with an interval between implementation due to seasonal availability and desired fire effects, and objectives. Ignitions would occur after all harvest treatments have been completed, and all activity fuels reduced and/or removed.

Prescribed fire would occur during periods when weather conditions and fuel moisture levels are within favorable windows to facilitate low to medium intensity surface fire. Prescribed burning would be conducted based on weather and site-specific conditions and would take place under the guidelines set forth in a prescribed fire burn plan developed specifically for this project area. Not all landscape burning acres identified would be treated either due to the fuels available during the burning conditions or at the discretion of the prescribed fire manager. Forested areas within the proposed prescribed fire units may be thinned and/or limbed prior to burning to reduce fuel loadings. Prescribed burning would reoccur as needed (approximately every five to ten years) or as needed to keep a current and functional fuel break for the safety of public and firefighters in the project area. Unplanned ignitions may be managed for resource benefit within the units identified for prescribed burning where it meets the objectives described above.

Direct ignitions in the RHCA, including landslide prone areas shall be avoided; fire will be allowed to back into these areas. No ignition would occur outside of mapped units; however fire would be allowed to back into areas outside of the units. Fire outside the units as would be allowed to burn as long as objectives are met and resource values enhanced.

Road Activities

Roads would be utilized in the project area to access harvest units. General road maintenance would take place prior to use and temporary road construction would occur to provide adequate access for harvest and some activity fuel treatment and reforestation.

Road reconditioning and reconstruction for haul: All roads used for haul would receive some level of work to provide suitable conditions for log haul.

Road reconditioning on approximately 20 miles of road could include roadside brushing, blading, ditch cleaning, removal of small cutslope failures, removal of obstructions such as rocks and trees, spot placement of aggregate where needed to provide for safe passage of vehicles and road surface erosion control. Reconditioning also includes maintenance of existing culverts.

Road reconstruction on approximately 19 miles of road could include the addition of cross drain structures near stream crossings, application of surface aggregate gravel materials, road realignment or reshaping, and placement of roadway fill and installation of new signs or gates. Other activities could include installation of drainage dips, road blading, brushing and removal of obstructions.

The definitions for road maintenance and road reconditioning above do not include all activities that can be completed under each classification; these definitions are for informational purposes only. Surveys conducted prior to project implementation would occur to determine the actual work needed.

Road reconditioning for watershed improvement (approximately 6 miles): Forest Roads 9714, 9709 and 9709A would receive general maintenance (reconditioning) to maintain or improve watershed health. Forest Road 9714 is identified for road improvements to support timber haul, however, approximately one mile not proposed for timber haul would receive maintenance. Forest Roads 9709 and 9709A will not be used for haul or to access timber harvest units but the roads would receive similar maintenance to haul routes. These road activities are expected to be implemented after timber related activities are complete and as funding permits. All activities completed will be to improve or maintain watershed health.

Temporary road construction (approximately 2.3 miles): Temporary roads would be necessary to access several timber harvest units. Temporary roads are not open for public use and would be necessary for actions authorized in the contract to proceed with these project activities because it is not included in the Forest transportation atlas. Access would be limited to active operations only. Approximately 2.3 miles of new temporary road construction would occur to facilitate harvest. Temporary roads would be constructed on or near ridge tops with no stream crossings and would be hydrologically disconnected from any stream network (Table 2). All temporary roads would be obliterated after use. Some temporary roads may over-winter if needed to access activity fuel treatment and/or reforestation areas. These roads would be hydrologically stabilized when not used and obliterated once fuels treatment and reforestation needs are met. Obliteration would eliminate future motorized use of the road, and would restore hydrological function and soil productivity by ensuring that the road has adequate drainage and ground cover to prevent erosion (Table 2 and Figure 3).

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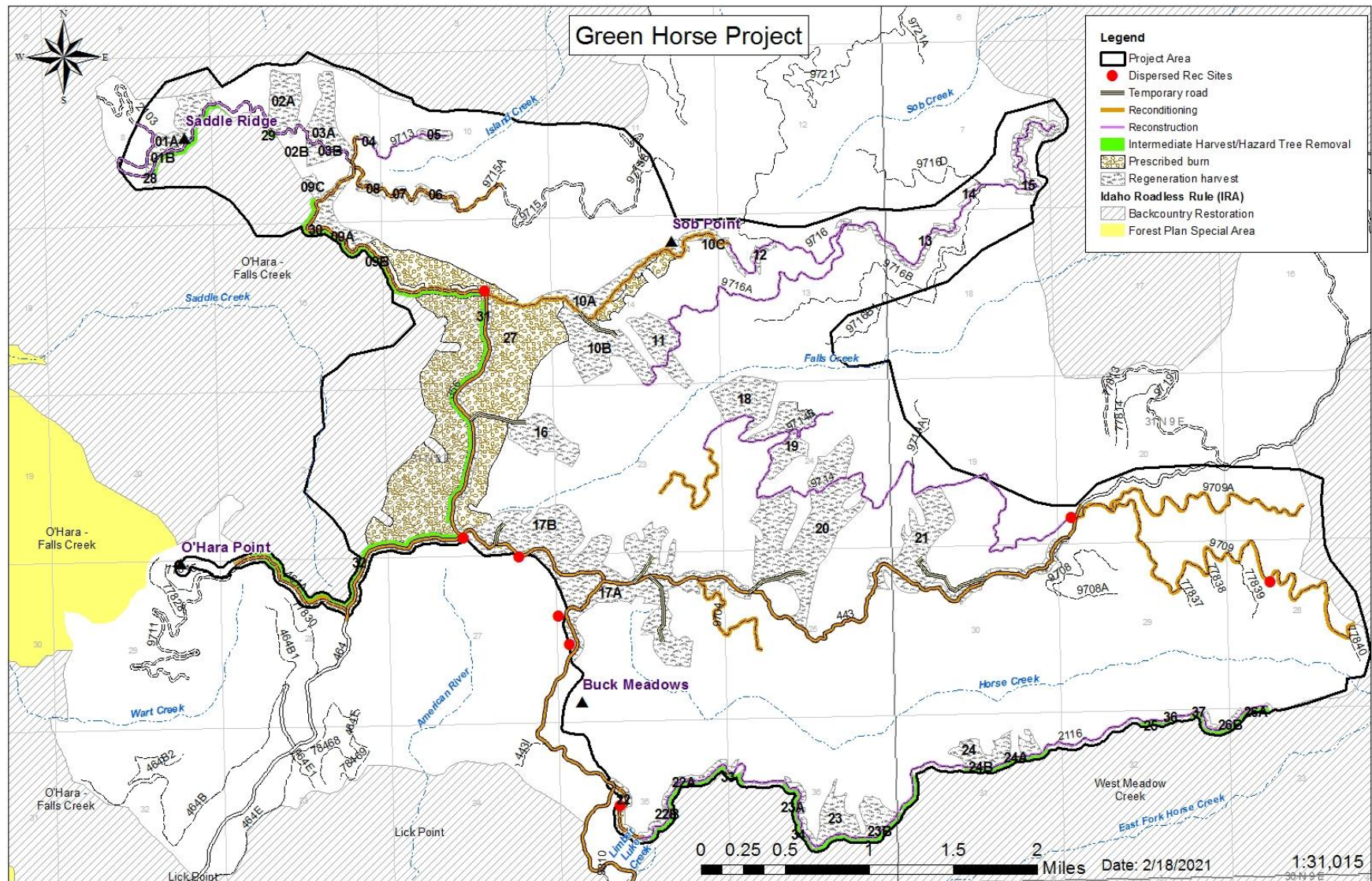


Figure 3. Map of Green Horse project area with proposed silvicultural treatments, hazard tree removal, road work, and temporary roads

Mitigation Measures

The Forest Service developed mitigation measures to be used as part of the Green Horse proposed action in Table 2. These mitigation measures were developed by the interdisciplinary team that address site-specific factors about the project that need protection over and above those already built into the design through “Standard Design Features” (document 11-004).

The Green Horse project was designed to avoid undesirable cause-effect relationships and potential effects to resource conditions; and ensure that these projects are consistent with the Nez Perce National Forest Land and Resource Management Plan, including the 1995 PACFISH amendment; and all laws, regulations, and policies such as Idaho Forest Practices Act, Clean Water Act, and Idaho State Water Quality Standards. These mitigation measures were developed from past projects and professional experience, have been verified by field surveys and monitoring, and will be used to limit possible adverse effects to soils, water quality, fish and wildlife habitat, and culturally significant areas.

Table 2. Green Horse project mitigation measures

SOIL RESOURCES		HOW IMPLEMENTED & EFFECTIVENESS
SR-1	In all timber harvest units, locate and design skid trails, landings and yarding corridors prior to activities to minimize the area of detrimental soil effects. Space tractor skid trails no less than 80 feet apart (edge to edge), except where converging on landings. <i>*This does not preclude the use of feller bunchers.</i>	Implemented through Mandatory Contract Provisions Effectiveness: High, based on experience
SR-2	In ground-based harvest units <u>where piling occurs</u> , only pile areas of high slash accumulation (exceeding 1 foot in depth) throughout the harvest unit.	Implemented through Mandatory Contract Provisions Effectiveness: Moderate, based on experience
SR-5	Keep piles less than 10 feet in height in units where piling occurs.	Implemented through Mandatory Contract Provisions Effectiveness: High, based on experience
SR-7	In unit 17, coarse woody debris (greater than 3 inches in diameter) will be retained at an average of 7-15 tons per acre following completion of activities. In unit 23, coarse woody debris (greater than 3 inches in diameter) will be retained at an average of 9-18 tons per acre following completion of activities. In all other units, coarse woody debris (greater than 3 inches in diameter) will be retained at an average of 17-33 tons per acre following completion of activities.	Implemented through Contract Provisions Effectiveness: Graham et al. 1994 – High, based on experience
SR-8	In all units, ground-based equipment will only operate on slopes less than 45% and tractor skidding will only occur on slopes less than 35%. Exceptions can be authorized where mitigation measures are applied and soil, slope and equipment are determined appropriate to maintain soil function.	Implemented through Contract Provisions Effectiveness: Unknown
ACCESS MANAGEMENT & PUBLIC SAFETY		
AM-1	Coordinate with the contractors and local organization(s) responsible for trail grooming. Will develop alternative parking, plowing, and timing agreement on groomed snowmobile routes.	Implemented through Contract Provisions Effectiveness: High, based on experience
AM-3	Retain access to identified dispersed campsites, after implementation is complete.	Implemented through Contract Provisions or sale layout and prep Effectiveness: Unknown
WILDLIFE		

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WL-1	Limit spring broadcast burning in units 18, 19, and 21 to protect (<i>big game calving, migratory bird breeding periods</i>).	Implemented through Rx Burn and Silviculture plans Effectiveness: High, dictated by Rx Burn and Silviculture plans.
WL-2	Prohibit all activities from December 1 through May 15 in units 18, 19, and 21 to retain security and reduce stress for wintering ungulates.	Implemented through Contract Provisions Effectiveness: High, easily determined by FS staff, and contract compliance.
WL-3	Prohibit all activities within units 18, 19, and 21 from May 15 through June 15 to avoid impacts on ungulate calving/fawning.	Implemented through Contract Provisions Effectiveness: High, easily determined by FS staff, and contract compliance.
FISHERIES		
FF-2	Avoid direct ignition of fuels within RHCAs	Implemented through Forest Service action Effectiveness: High, based on experience and local monitoring.
FF-3	All reconstructed and temporary constructed road segments within RHCAs would be graveled 100ft. on either side of the crossing upon completion of reconstruction/construction	Implemented through Mandatory and other Contract Provisions Effectiveness: High, based on experience and scientific monitoring.
NOXIOUS WEEDS		
NW-1	Use Forest Service approved native plant species or non-native annual species mixes and mulches that have been certified weed-free seed and mulch.	Implemented through Contract Provisions Effectiveness: Moderate, based on experience
ARCHAEOLOGY		
A-2	Healthy live trees with blazes and historic tin message boards/signs will not be harvested within units 10, 12, 13, 14 and 27. The trail tread will be avoided by project related activity. The only exception to avoidance would be in limited areas where skid trails may be established to concentrate ground disturbance in specific locations identified in consultation with the Zone Archaeologist. Upon project completion these skid trails will be rehabilitated and returned to their pre-harvest condition.	Implemented through Mandatory Contract Provisions Effectiveness: High, based on experience
A-3	Healthy live trees with blazes, phone line insulators attached and historic tin message boards/signs will not be harvested within units 23, 34, 35, and 36. The trail tread will be avoided by project related activity. The only exception to avoidance would be in limited areas where skid trails may be established to concentrate ground disturbance in specific locations identified in consultation with the Zone Archaeologist. Upon project completion these skid trails will be rehabilitated and returned to their pre-harvest condition.	Implemented through Mandatory Contract Provisions Effectiveness: High, based on experience
A-4	Site 01170001196 is located approximately 40 meters south of a proposed roadside harvest unit (unit 17). The site will be avoided by all project related activity.	Implemented through Mandatory Contract Provisions Effectiveness: High, based on experience

Alternatives Considered but Eliminated from Detailed Study

Public comments received in response to the proposed action provided suggestions for alternative methods for meeting the need for the proposal. Three alternatives were considered but dismissed from detailed study for reasons summarized below.

No Harvest within Idaho Roadless Areas

A comment was received recommending that the Forest Service consider not harvesting within the Fall Creek-O'Hara and West Meadow Creek Idaho Roadless Areas; including no harvest specifically along roads within the Idaho Roadless Areas that are closed (open to administrative use only). This alternative was considered but eliminated from detailed study; the Idaho Roadless Rule does preclude the mitigation of hazard trees within roadless areas. Removal of timber incidental to actions not prohibited by the Idaho Roadless Rule is allowable; removal of this timber is incidental to activities described under the proposed action. Further, this alternative would not respond to the need to reduce fuels and hazard trees along roads for public and firefighter safety for protection of timber resources and to maintain recreation opportunities.

Decommission roads that are not currently used, roads not needed for future management, and/or roads with hazard trees

A comment was received that suggested the Forest Service include road decommissioning for roads that are not currently used and roads that are not needed for future management. This recommendation from public comments also included decommissioning roads, rather than removing hazard trees along them. This alternative to the proposed action was considered but eliminated from detailed study because the project interdisciplinary team documented a roads analysis that resulted in project area roads to be needed for future management including but not limited to providing access to manage plantations, fire suppression, etc. (document 14-001). The roads analysis also informed the need of for this proposal to keep it focused on improving forest health and providing for public safety. Future management of this area is needed and is directed by Forest Plan management areas 12, 16, 17 to manage timber production while providing for other multiple uses and resources that also includes improving the quality of winter range for big game by timber harvest and prescribed burning.

Watershed restoration in O'Hara Creek

Comments suggesting that the project should include watershed restoration in O'Hara Creek. This was considered but eliminated from detailed study because after assessing the existing condition of the project area, the Responsible Official decided to keep the need for the Green Horse proposal focused on treatments to improve forest health and reduce hazards along roads. The road maintenance, reconditioning, and reconstruction work proposed by the project would not result in additional road-related sediment reductions whilst allowing for forest restoration and economic support to local communities. Watershed restoration activities are encouraged and can be authorized under a separate decision. Although not in the O'Hara subwatershed, additional road maintenance was added to the proposed action in partnership with the Nez Perce Tribe to improve road conditions for resource concerns.

Environmental Impacts

This section briefly describes the existing condition of the project area and discloses the anticipated direct, indirect, and cumulative impacts of the proposed action and taking no action. The information summarized in this section was obtained from published and unpublished materials; field surveys conducted in the project area, and resource analysis. For purposes of this analysis, the terms effects and impacts used in this section have the same meaning (40 CFR 1508.8).

The project record provides a central location where project information that supplements this environmental assessment is filed and is available on the Green Horse project webpage:

<https://www.fs.usda.gov/project/?project=57152>. Relying on supporting material in the project record helps implement the CEQ Regulations' provision that agencies should reduce NEPA paperwork (40 CFR 1500.4). This environmental assessment furnishes site-specific information to demonstrate a reasoned consideration of the environmental impacts of the proposed action and how these impacts can be mitigated, without repeating detailed analysis and background information available elsewhere.

Interrelated Actions

As required under NEPA and the regulations implementing NEPA, interrelated projects are considered in determining potential cumulative impacts from past, present, and reasonably foreseeable future actions combined with the Proposed Action. Cumulative effects analysis areas were defined by each resource to better understand anticipated effects (40 CFR 1508.7).

Past, present, and reasonably foreseeable future actions were considered in analyzing cumulative effects (and vary by resource analysis). These actions may include, but are not limited to, past harvest within the O'Hara Creek, Glover Creek-Selway River, Horse Creek, and Upper American River subwatersheds such as the Red Moose Divide Salvage, Johnson Bar Fire Salvage, Hamby Saddle Hazard Tree Removal, Limber Elk, Dutch Oven, Road, Administrative and Recreation Site Maintenance projects; Horse Creek timber sale, Aerial Detection Survey Road Maintenance (ADSIRM), Limber Elk, and other timber sales that date back to the 1960s. Other activities that may be considered for cumulative effects include but are not limited to: Nez Perce National Forest Travel Management (DRAMVU), road decommissioning, firewood cutting, fire suppression, Wash fire pile burning, past fire activity (Johnson Bar and Wash Fires), and permitted cattle grazing.

Resources not Present or not Affected

Resources or uses that were not present or not directly or indirectly impacted by the proposed action and not further analyzed include:

- Heritage and Cultural Resources
- Lands and Special Uses
- Developed Recreation
- Threatened or Endangered plant, fish, and wildlife species
- Wetlands
- Wild and Scenic Rivers
- Wilderness

Additional details describing the resources and uses mentioned above are located in the project record and/or under the Finding of No Significant Impact that is located in the project record (documents 15-001, 16-001).

Forest Vegetation

No Action

For the No Action alternative, no new or additional vegetation management activities would occur within the project area. The environmental consequences of the no action alternative are described below as they relate to the forest indicators listed in Table 3.

Species composition would remain predominately late-seral, shade-tolerant species. Over time, any remaining shade-intolerant species would be replaced by shade-tolerant species. Susceptible trees (grand fir, subalpine fir, and Douglas-fir) would continue to succumb to root disease, leaving openings in the canopy. While more open canopies can be a desired condition for big game forage, the persistence of root disease within the stand would hinder successful regeneration, especially in the absence of any root-disease-resistant species. Types of old-growth that could be achieved on these sites with current species composition would be limited due to root disease becoming more prevalent.

The current diameter distribution would slowly change as shade tolerant trees species would continue to grow in the understory, and larger trees would continue to grow into the next larger size class. While larger trees are preferred for fire-resistance, most of the larger trees would be comprised of the shade-tolerant species, and would not be fire-resistant nor would they be likely to meet age or size requirements for old-growth stands, due to mortality from root disease and/or insects.

As root disease continues to spread, large tree size-classes would decrease, and mortality would increase existing fuel loads. As the canopy opens up, new seedlings could become established; however, because they would be susceptible species, they would continue to feed the root disease and increase the number of susceptible trees on the landscape (Hagle 2004). This cycle could lead to an overall loss of old-growth within the project area, as trees would eventually succumb to root disease before reaching the desired age and size class for old-growth. It could also lead to a loss of timber production on forested land, if stands regenerate with susceptible trees species that fail to reach merchantable sizes (Byler & Hagle 2000).

Proposed Action

Refer to the Proposed Action section for a detailed description of the proposed action. The direct and indirect effects of the proposed action on forested vegetation are listed below. The analysis area for direct and indirect effects on forested vegetation are the proposed treatment units.

Direct and Indirect Effects

For the Proposed Action, there would be direct effects on tree species composition, size class distribution and forest health. Indirect effects of the Proposed Action include reduced potential for severe fire through fuel reduction, increased resilience of forested stands to insect and disease outbreaks, and the potential for increased availability of forage for big game for approximately 10 years. See the Wildlife Effects for more information on big game forage.

Regeneration treatments would be in areas where root disease is concentrated, in areas at risk from insects, and/or areas suitable for restoration of early seral species. In any regeneration treatment, the largest, healthiest trees would be retained in the stand to meet multiple resource objectives including but not limited to wildlife habitat, coarse woody debris recruitment, future seed source, and visual-quality objectives.

Table 3. Direct and indirect effects for the proposed action

Resource Element	Resource Indicator	Measure	Proposed Action Direct/Indirect Effects
Forest Cover Type	Tree Species	Acres of change in dominant species composition (i.e. change from shade-tolerant to shade-intolerant)	-Acres of shade-tolerant, late seral species reduced across the 1,513 acres of regeneration harvest -Planting an average of 300 TPA across treatment units with a mix of western larch, ponderosa pine, spruce, lodgepole and western redcedar in appropriate habitat types
Diameter Distribution	Tree Sizes	Percent of forest dominated by distinct tree size classes.	-Regeneration treatments would lead to increased seedlings/saplings across approx. 1,513 acres - Prescribed fire would reduce seedling/sapling stages in treated areas, favoring larger, mature trees across approximately 570 acres

Resource Element	Resource Indicator	Measure	Proposed Action Direct/Indirect Effects
Forest Health	Insects & Disease	Acres of insect & disease susceptible species	<p>-Reduce overall amounts of late seral species that are susceptible to root disease across the 1,513-acre treatment area</p> <p>-Prescribed fire would reduce grand fir saplings/pole-sized trees across approximately 570 acres, though fire scars could contribute to future decay/injury of mature fire-sensitive trees</p>

Forest Cover Type: Tree Species

The proposed action would restore vegetative species composition to early seral species through regeneration harvest. Current species are predominately grand fir, or grand fir-mix (grand fir, Douglas-fir, subalpine fir and spruce), with only 4% of total treatment acres comprised of early seral species (document 04-014 p. 11).

Shade-intolerant species, such as western larch, rely on the open space provided by regeneration harvests to have enough sunlight, bare mineral seedbed, and growing space to successfully regenerate (Fiedler & Lloyd 1992, Schmidt et al. 1976). Shifting tree species composition by retaining and planting early seral species (such as ponderosa pine or western larch) in the project area would help trend the area toward desired stand conditions. Western larch is both fire-and root-disease resistant (Schmidt et al. 1976, Hagle 2004), while ponderosa pine is fire-resistant and drought-tolerant (Burns & Honkala 1990). Other species that may be planted include western redcedar, spruce and lodgepole. Exact determination of what species will be planted in what unit will depend upon habitat type (as described in Cooper et al. 1991), aspect and slope, and will be outlined in the detailed prescriptions prior to implementation.

Intermediate treatments are not expected to shift species composition from existing dominant forest cover types. Species removed will largely depend upon which species are dead and dying.

Prescribed fire will not impact dominant forest cover types in this project. While it will reduce the overall number of shade-tolerant species in the short term, regeneration will be grand fir/Douglas-fir, as there is not enough early seral species within the treatment units to naturally regenerate desired species. Where prescribed fire and regeneration units overlap, forest cover type will be changed to desired species through planting of early seral species such as western larch and/or ponderosa pine where appropriate.

Diameter Distribution: Tree Size Classes

The proposed action would shift tree size classes by moving approximately 1,513 acres into the seedling/sapling stage. Due to retention requirements, landslide prone areas, riparian buffers and areas dropped from layout, not all proposed regeneration treatment acres would shift to seedling/sapling stage.

Shifting size classes will result in a decrease in crown density within treatment units. Decreased crown density reduces the potential for crown fire spread (Agee & Skinner 2005). In addition, crown base height would be increased as the largest trees are retained on the landscape and the smaller trees are removed. Seedlings and saplings will not contribute to crown fire ignition or spread until they are tall enough to act as ladder fuels (approx. 10-20 years after treatment) to adjacent stands.

Current tree size classes within proposed treatment areas are predominately in the 15-19.9-inch size class (document 04-014 p. 14). Shifting tree size classes would mimic a stand-replacing event, creating

heterogeneity across the landscape with a mix of size classes and increasing the percentage of seedlings/saplings across the landscape. Large patches of regeneration would mean future large patches of mature trees in approx. 50-70 years.

On a landscape scale, large trees would be retained in riparian buffers, in retention clumps across harvest units, on landslide prone areas and in stands being managed for old growth.

Intermediate treatments are focused on dead and dying hazard trees of all size classes. Some units could see an increase in average diameter, and some units could see a decrease in average diameter depending on the amount and size of trees removed.

Prescribed fire would reduce the amount of smaller size classes, favoring the larger size classes and increasing the stand canopy base height. Delayed mortality of intermediate-to-large size classes would be dependent upon tree species, with greater mortality in spruce, subalpine fir and grand fir. Mature grand fir are moderately resistant to fire compared to spruce or subalpine fir, however ground fires burning into thick duff can injure shallow roots and contribute to delayed mortality (Howard & Aleksoff 2000).

Forest Health: Insects and Disease

The proposed action would reduce the amount of root-disease susceptible species and would reduce the amount of dead and dying trees within the project area.

Root disease causes an estimated loss of 166 million cubic feet of wood per year in the U.S. Forest Service Northern Region (Lockman & Kerns 2016). It is a condition of the site that can be affected by forest management practices, either positively or negatively depending upon the site conditions and management practices. Avoiding partial cuttings such as intermediate treatments can help prevent the spread and intensification of the root disease on-site (Hagle 2004). Management practices that reduce the spread of root disease are consistent with forest plan direction to manage for timber production and other multiple uses on a sustained-yield bases in Management Area 12. Both grand fir and Douglas-fir are highly susceptible to root disease and any regeneration within canopy gaps created by windthrown trees or recently-killed snags will continue to perpetuate the disease. If susceptible species are allowed to persist on-site, it can lead to a reduction in forested acres over time (Hagle et al. 2016, Byler & Hagle 2000, Shantz 2015).

The proposed action includes several openings greater than 40 acres; these are concentrated in areas where in order to be most effective, treatment units over 40 acres should be considered to treat the extent of the root disease and successfully reforest with shade-intolerant species such as western larch, which is more resistant to root disease. Treating these areas will lessen the number of acres of susceptible tree species on the landscape and meet the purpose and need by reducing extent of insect and disease infection and altering species composition to include higher percentages of early seral species. More information on the proposed openings greater than 40 acres can be found in the project record (document 17-011).

Since root disease can be an underlying predisposing factor for insect risk, treating stands with root disease can also reduce risk of insect outbreaks for grand fir and Douglas-fir. Bark beetles are often found in areas with root disease and can be a secondary cause of mortality within infected stands (James et al. 1984). During project development, the presence of western hemlock looper was found within the project area. Further site visits determined that the amount of defoliation was less than originally estimated from the aerial detection surveys. On-going monitoring shows levels of hemlock looper in decline across the forest (Malesky et al 2020). While levels of defoliation may not directly cause widespread mortality, it can contribute to overall mortality if trees have multiple stressors (i.e. drought, bark beetle outbreaks, root disease).

Intermediate treatments would decrease the number of dead and dying trees adjacent to roads and other infrastructure. This would lead to better ingress/egress for firefighters and the public, a reduction in the

extent of insect and disease and a reduction in hazardous fuels along roadways, while maintaining forested cover within the roadless area.

Prescribed fire will reduce the amount of root disease susceptible species on the landscape (see discussion above in tree size class), favoring the larger size classes over the smaller. In general, the greatest influence prescribed fire has on increasing or decreasing root disease susceptibility within a given stand is its influence on species composition, stand structure and tree vigor (Rippy et al 2005). There is potential for some damage to the boles of residual trees from fire that can allow for entry of stem rot and other pathogens over time, but it would be expected that damage would be limited to individual trees rather than the entire stand.

The proposed action would move the Green Horse project toward desired conditions of reducing hazardous trees along roads, increasing early seral species, decreasing hazardous fuels, reducing extent of insect and disease and maintaining recreational opportunities within the area (through removal of hazard trees).

Table 4. Summary of environmental effects to forested vegetation.

Resource Element	Indicator	No Action	Proposed Action
Forest Cover Type	Tree Species	-Shade-tolerant species dominating canopy & understory across 1,513 acres	-Percentage of shade-tolerant species reduced across 1,513 acres
		-Shade-intolerant species continues to decline within treatment area	- Percentage of early-seral species increased across 1,513 acres
Diameter Distribution	Tree Sizes	-Smaller size classes decrease across landscape -recruitment into larger size classes slowed due to mortality from root disease	-Regeneration treatments would lead to increased seedlings/saplings in treated areas (1,513 acres) -Increased openings for elk forage -Reduced canopy density
Forest Health	Insect & Disease	-low tree vigor and volume production	-Individual tree vigor promoted across 180 acres
		-Increase in root disease extent	- Disease resilience and resistance increased across 1,513 acres
		-continued mortality of shade-tolerant regeneration due to root disease infection, reducing overall timber volume production in the project area	-Maintained or increased volume production across 1,693 acres from planting root-resistant species and removal of hazard trees

Cumulative Effects

Past, Present, and Reasonably Foreseeable Activities Relevant to Cumulative Effects Analysis

Cumulative effects result from incremental effects of actions, when added to other past, present, and reasonably-foreseeable future actions, regardless of the agency or person that undertakes such actions. The Green Horse treatment units are the cumulative effects analysis area.

Past activities within the analysis area that have affected forest cover types and forest health include timber harvest, wildfires, and fire suppression. Past fire suppression tactics have allowed shade tolerant species to outcompete shade-intolerant species. Past harvest has also favored the development of late-seral, shade-tolerant species that are susceptible to root disease. The tree species and size classes that resulted from past management is documented in the existing condition (document 04-014 pp. 11-14).

There are no present or reasonably foreseeable future vegetation treatments identified within the treatment units, other than those being proposed by the Green Horse Project.

Cumulative effects from the Green Horse project include establishment of early seral species back on the landscape, a reduction in mortality and volume loss from root disease and establishing a more resilient stand for future disease and fire disturbances. Cumulative effects from the No Action include increased mortality from root disease and insects, loss of volume/timber production on forested lands and loss of early seral species on the landscape.

Fuels

Existing condition and all supporting information for the effects analysis is located in the project record (document 19-001). Analysis area is the Green Horse project area and time frame of effects is ten years or less after project activities.

No Action

Fuel Conditions and Fire Behavior

The no action alternative would not alter the fuels condition in a way that reduces fire behavior. Flame lengths, rates of spread, and fire type would remain similar or slightly increase over time; therefore, there would be no beneficial direct effects regarding forest fuels or fire behavior. With no modification of fuel loading and forest structure, fire behavior under normal, summer conditions would persist as described under the existing condition, threatening resources within the project area and adjacent to the project area (document 19-001). Fire would still be allowed to play its natural role where appropriate and desirable but would be suppressed where necessary to protect life and resources. Fire Behavior Fuel Models would remain as they are in the existing condition with a slight increase in fuel loading over time.

Bulk Densities

The no action alternative would not alter continuity and density of canopy within the project area and it would remain at similar levels or slightly increase from describe in existing conditions (document 19-001).

Suppression Efforts and Safety

The no action alternative would retain hazard trees along road systems which would continue to be a safety concern for public and firefighter's safety.

In the absence of any kind of human-caused or natural disturbance, the forest would change with natural progression and growth. Any increase in surface, ladder, and crown fuels would affect flame length, contribute to the torching of trees, and make crown fire more likely (Peterson et al. 2005, Graham et al. 2004). Wildfires that escape initial attack are likely to become large and damaging. Direct fire suppression tactics would not be as effective as compared to the proposed action. Fire risk in the project area would likely increase and contribute to wildfires that could become more difficult and more costly as conditions worsen with time.

Proposed Action

Direct and Indirect Effects

Fuel Conditions and Fire Behavior

Under the proposed action, treatments are expected to create variation in stand structure and break up fuel continuity. Basic principles as described by Peterson and others (2005) that reduce fuel loading, ladder fuels, and stand density will reduce potential fire intensity, torching of trees and crown fire. All of these principles have been integrated into the design of the proposed action of the Green Horse Project. However, in extreme weather conditions, such as drought and high winds, fuel treatments may do little to mitigate fire spread or severity (Pollet and Omi 2002). Alteration of the fuels condition would reduce fire behavior by decreasing flame lengths to a manageable level, reducing high rates of spread to a lesser rate range, and altering the fire type to a higher surface fire percentage over the project area. There would be beneficial direct effects regarding forest fuels or fire behavior. With modification to fuel loading and forest structure fire behavior would be in a more desirable range for suppression activities and management of natural ignition fires and protecting timber resources. Under the proposed action progress would be made towards the restoration of ecological processes to help maintain current fire regimes, transition to historic fire regimes, to enhance ecosystem resiliency and lower hazardous fuels. Fire would still be allowed to play its natural role where appropriate and desirable but would be suppressed where necessary to protect life and resources.

Under the proposed action, progress would be made towards maintaining current Fire Behavior Fuel Model (FBFM) GS2 Grass-Shrub Fuel Type Model, and TL3 Timber Litter Fuel Type Model conditions thru landscape prescribed fire (Scott and Burgan 2005). A 10% reduction in the heavily loaded FBFM TU5 Timber Understory Fuel Type Model by altering species composition to include more early seral species that are less susceptible to disease infection on appx. 16% of project area.

Bulk Densities

The proposed action would lower canopy bulk density, this alteration of continuity and density of canopy within the project area will reduce crown fire probabilities. Allowing safer management of wildfire within the project area.

Suppression Efforts and Safety

Under the proposed action there would be a decrease in the number of dead and dying trees adjacent to roads and other infrastructure. This would lead to better ingress/egress for firefighters and the public, a reduction in the extent of insect and disease and a reduction in hazardous fuels along roadways, while likely maintaining forested cover within the roadless area. There would be a reduction in potential fire behavior because flame lengths would be decreased, rates of spread decreased, and fire types modified to more surface based fire within the Green Horse project area. Keeping a wildfire out of the tree crowns and on the surface will aid firefighters to safely manage a wildfire, as well as reducing the chance of an unwanted wildfire event. Landscape burning will maintain natural openings, reduce surface fuels, litter depth, and ladder fuels; increase canopy base height, and provide a fuel break in strategic locations along Forest Roads 356 and 9716 for wildfire management in the future and public and firefighter safety.

Air quality

The analysis area is the project area and the Selway Bitterroot Wilderness, 10 miles to the east that is a Class 1 airshed area (document 19-001).

Smoke dispersal output generated by the BlueSky Playground model for broadcast burning indicated that impacts to sensitive areas will be within compliance of the Montana/Idaho Airshed Group. Output indicated that PM-2.5 generated by broadcast burning would be below NAAQS (refer to Figures 1-4 in

document 19-001). The Selway-Bitterroot Wilderness is the most probable area to be impacted (10 miles to the East). BlueSky Playground estimated that the daily maximum concentration for a 50 acre fall burn would be less than 35 PM-2.5 if directly downwind.

Cumulative Effects

The cumulative effects area for fuels is the project area boundary because project activities would have localized effects on fuels and fuel continuity. Activities considered for cumulative effects are those that effect flame length, canopy base height, crown bulk densities, and surface fuel loadings. These in turn affect suppression capabilities in the analysis area. Fire suppression, timber harvest, and fuels reduction projects are the only past, present, and reasonably foreseeable activities considered in combination with proposed activities.

Time frame for cumulative effects would be approximately ten years, since that is how long treatments would remain effective before surface and ladder fuels would become a concern.

Cumulative effects are those that would result from activities proposed in addition to the incremental impacts of past, present, and reasonably foreseeable future actions. The primary actions to be considered when evaluating cumulative impacts in the fire/fuels analysis is 1) fire suppression, which has occurred in the past, is occurring in the present, and is likely to continue in the future; and 2) past treatments that have manipulated vegetation and fuels. Fire suppression has had an impact on the vegetation in the project area. The Nez Perce Forest Plan standard is to control, confine, and contain wildfires in this area. By restricting fire spread through suppression, fuels that would have been reduced by wildfire have now been allowed to accumulate, increasing the probability of large and more intense fires. The actions proposed by this project will enhance past treatments by a further reduction in the fuels profile across the project area. Past treatments are represented in the existing condition described above. The combined cumulative effects from past actions and the ongoing and foreseeable actions would result in a change to the fuel condition, fire behavior, bulk densities, and suppression efforts and safety. If the current policy of fire suppression continues, fuels would increase in the project area. However, in treated stands the changes in the fuel bed from management activities would contribute to reduced fire behavior conditions.

Because burning will be coordinated through the Montana/Idaho Airshed Group, it is unlikely the smoke would combine with smoke from other projects or a wildfire to cumulatively exceed air quality standards in the analysis area.

Botany

The Green Horse project area is dominated by seral species due to past fire exclusion. Early seral species such as Ponderosa pine and western larch are present but reduced from historic levels. Overall forests are dense and vegetatively simplified compared to historic conditions. Botanically the lands in the project are also simplified compared to past conditions that were shaped by disturbance to be more diverse and complex. Habitat for late seral species has increased, while species with an affinity for more open conditions have likely declined.

Two species of concern are known to occur in the project area, but potentially suitable habitat for several others is present. Given the extensive area of suitable habitat for some of the species of concern, it is anticipated that additional undocumented populations may occur.

Direct and indirect effects were analyzed within the context of the project area. The area of consideration for cumulative effects includes lands within the entire project area as well. The rationale for this is that the effects are site specific to areas treated within the project area and will not extend beyond the boundaries, and effects from outside the defined area will likewise not affect the resource within. These effects are considered only for the species potentially affected by this project from the initial habitat transformations in the early 1900s through the proposed and reasonably foreseeable future. Supporting information for the botany resource analysis is located in the project record and is incorporated by reference per 36 CFR 220.7(a) (document 21-001). The Forest-wide Pocket Gopher Control Decision

Memo signed on September 20, 2017 is incorporated by reference and it documents that no significant effects would occur to plant species (document 11-003).

No Action

Since there are no activities proposed under this alternative, there would be no direct, indirect, or cumulative effects on plant species or habitats. However, changes in stand structure would be expected through time, some of which would alter habitats that are suitable for some sensitive plant species. In some cover types, forest openings may occur as seral species decline. In more mixed-conifer forest types, succession would continue to progress, resulting in a decline in size and frequency of small openings and forest gaps. In general, species requiring later seral forests would see an improvement in habitat quality and species with poor dispersal mechanisms would have an increased opportunity for establishment. Species requiring more open conditions would likely decline barring the absence of significant fire or other forest clearing event such as severe wind or disease. The increased severity of wildfire is possible due to the increased fuel build up in areas of past fire exclusion. Such an event would favor early seral species, while reducing or eliminating habitat for late seral species. More severe fires also pose an increased risk for an aggressive weed response following the event.

Proposed Action

Direct and Indirect Effects

The primary management activity that may affect species or habitats of concern in the Green Horse project would be timber harvest, particularly the regeneration harvests which subject the habitat to more mechanical disturbance and alter the light, temperature, and moisture regimes that determine distribution for most plants. Early seral species may benefit from such changes, but later seral species would decline or be extirpated. The implementation of intermediate harvest has some potential for direct mechanical harm during implementation, but generally the overall habitat conditions likely would not change enough to harm most late seral species. Much of the preferred habitats utilized by later seral species are generally associated with riparian areas that are excluded from proposed units or protected by application of PACFISH riparian buffers.

Prescribed fire and fire associated with site preparation post-harvest is generally implemented under moderated conditions that allow fuels to be treated without displacing large areas of forests. While direct effects to plants on the ground can occur at implementation, the overall habitat through time is not substantially changed. However, some localized areas may burn severely and result in ecological changes. In the riparian areas of the moister forest types it is less likely that fire would carry with enough severity to appreciably alter habitat; however, there is some potential for this. Species requiring more open habitats could benefit from fire that reduces conifer or brush encroachment; however, invasive weeds could increase in such areas as a response to the disturbance. Habitats for sensitive plant species will undergo a mix of beneficial to detrimental effects depending upon the severity and placement of fire and the individual species ecology. With these treatments, plants may be harmed upon implementation but the stand ecology determining plant distribution would not change appreciably overall.

Reconstruction of existing roads are viewed as maintaining current conditions from the perspective of suitable habitat for rare and sensitive plants as these old roads generally do not provide any potential habitat for species of concern. Where these routes cross streams or low moist areas, there is the possibility of mechanical damage or negative effects to occurrences or suitable habitat within the vicinity of the road. However, these impacts would be anticipated to be negligible and rare because work would be almost entirely limited to the road crossing itself with limited impact to adjacent ground. Roads are also a direct disturbance to suitable habitats. Temporary road segments were sorted by potential habitats for sensitive plant species, and it is assumed that for each mile of road constructed approximately 2.5 acres of habitat would be reduced over the short term. Recovery of such sites could be relatively rapid for early seral

species that may quickly colonize disturbed ground, but for late seral species many decades may pass before habitat is again suitable.

The effects analysis is based on evaluation of the proposed management activities occurring in potentially suitable habitat and the potential for those activities to directly or indirectly effect plant populations or habitat characteristics. Effects for each species supporting the determinations of the biological evaluation located in **Table 5** is located in the project record and incorporated by reference (document 21-001).

Table 5. Summary of effects for sensitive plant species with known occurrence and potential habitat in the project area

Species	Known Occurrence	Proposed Activity	Acres Affected by Proposed Action	Determination*
*Payson's milkvetch <i>Astragalus paysonii</i>	Yes	Regeneration	442	BI/MI
		Intermediate	91	
		Prescribed Burn	290	
		Temporary roads	2	
Deerfern <i>Blechnum spicant</i>	No	Regeneration	54	MI
Moonworts <i>Botrychium</i> spp.	No	Regeneration	274	MI
		Intermediate	29	
		Prescribed Burn	47	
		Temporary roads	2	
Green bug-on-a-stick <i>Buxbaumia viridis</i> (moss)	No	Regeneration	1,108	MI
		Intermediate	112	
		Prescribed Burn	286	
		Temporary roads	3	
Clustered lady's-slipper <i>Cypripedium fasciculatum</i>	No	Regeneration	421	MI
		Intermediate	30	
		Prescribed Burn	27	
		Temporary roads	1	
Light hookeria <i>Hookeria lucens</i>	No	Regeneration	54	MI
Naked-stem rhizomnium <i>Rhizomnium nudum</i> (moss)	No	Regeneration	294	MI
		Intermediate	6	
Evergreen kittentail <i>Synthyris platycarpa</i>	Yes	Regeneration	721	BI/MI
		Intermediate	107	
		Prescribed Burn	559	
		Temporary roads	4	
Idaho barren strawberry <i>Waldsteinia idahoensis</i>	No	Regeneration	5	BI/MI
		Intermediate	1	

***Sensitive Species Determination:** BI = Beneficial Impact; MI = May impact individuals or habitat but not likely to cause trend toward federal listing or reduce viability for the population or species.

Cumulative Effects

Discussion of cumulative effects for rare plants is addressed through the general trend of the suitable habitat required by these species as a result of past, present and future management actions. It generally is not possible to directly quantify effects of specific activities that are several years or decades old on species of concern today. The status and occurrence of rare plants was completely unknown for much of the management history of the watershed. Historically the changes in condition and abundance of specific habitats important to these species are also largely unknown. Therefore, the effects of these past projects can only be qualified through general discussions. However, the results of past projects contribute to the current condition, which can be used to discuss and quantify effects of proposed activities on rare plant species.

The primary management activities that have influenced rare plant habitat in the Green Horse area and continue to under this project include past and present timber harvest, fire, and road construction. Timber harvest started in the area in the 1970s through the 2000s and has not occurred since. Thus, overall trends of harvest and road construction impacts have been downward with a corresponding decline in effects to plant habitat. In addition, advancement in harvest operations and logging technology would further reduce resource impacts.

Ongoing and foreseeable actions within the proposed activity areas consist of recreation, grazing, fire suppression and weed treatments. Improved forage in harvest areas will serve to draw livestock away from some of the more sensitive areas where rare species and suitable habitat are found. Motorized recreation and dispersed-camping activities may increase in the future, but the effects would be largely limited to designated existing routes and dispersed-camping areas. This would result in fewer acres affected by these activities overall with a reduction in impacts to rare plant species. Maintenance of these travel routes is considered routine and ongoing, with virtually no effects to the habitat which they pass through.

Grazing would continue to potentially impact vegetation in some harvest areas; however, due to terrain most effects would be along roadways. Ongoing allotment management activities are designed to continue to improve trends in rangeland health, vegetation, watershed conditions, and in ecological sustainability relative to livestock grazing. In addition, the improved forage in harvest areas will serve to draw livestock away from some of the more sensitive areas where rare species and suitable habitat are found.

Summary of Effects of the Proposed Action

The proposed action adds short-term disturbance to this landscape through timber harvest, prescribed burning, and temporary road construction. These activities would result in a localized decline in potentially suitable sensitive plant habitat for species requiring late successional habitat. Such a downward trend in habitat quality would not lead to concerns for overall population viability, since these habitats are common in other parts of the project area. Recovery of suitable habitat in the treatment areas could vary from a few years to several decades depending upon the species. In the project area as a whole, the overall trends in habitat for these species would be increasing with the overall advancement of succession. Sensitive species requiring open habitats would see some localized improvements in some treatment areas. This is especially true where habitats are naturally open, or trees might be encroaching onto grasslands. However, the effects through time on this habitat would be mixed as existing individual plants could be damaged if present. The site prep burn activity would also contribute to maintenance of such habitat; however, these disturbances could increase weed infestations in the area.

Invasive Species

No Action

Taking no action would result in the continuation of the weed management strategies developed across the Selway River basin. Weeds would continue to be managed with a high-priority/eradicate-objective within the project area. Levels of herbicide applications within the project area would remain at current levels in the short-term. In the long-term rates would decline or increase based upon the priority the project area receives on the Forest. No actions from the Green Horse project would result in plant succession that would move the area toward more dense stands with multiple canopies in forested habitat type groups. No action could decrease the rate and spread of weeds until stand replacement fires occur.

Proposed Action

Direct and Indirect Effects

In the short term, the planned activities would result in soil disturbance and, consequently, increase soil erosion. Increased soil disturbance and soil erosion would lead to an increase in invasive plants. Spotted

knapweed, orange hawkweed, and rush skeletonweed directly displace native plants, thereby indirectly degrading habitat for wildlife that are dependent on native plants for critical forage and cover.

One invasive plant that would increase due to soil disturbance is spotted knapweed. Research has shown that spotted knapweed dominated sites typically have more bare ground which directly leads to increased soil erosion (Lacey and Marlow 1990).

Integrated Pest Management (IPM) would be implemented prior to, during, and following the planned activities. Integrated Pest Management prescribes the control of invasive plants with herbicide, and the acreage measured (mapped). In the early stages of this project, herbicides will be used as the primary method to eradicate and control invasive plants (draft NPCNF Programmatic Weeds Biological Assessment 2020).

One component of IPM is the requirement that all equipment used in vegetation treatment, temporary road construction, road conditioning and road reconstruction to be inspected to confirm that it is weed free prior to use on the Green Horse project area (document 22-001). Another component of IPM is the use of a native seed mix specific to the Nez Perce Clearwater National Forests (Table 2). The seed mix would be seeded on disturbed soil areas as needed to reduce soil erosion by providing soil cover and occupy disturbed soil areas, as opposed to those sites being occupied by invasive plants.

Integrated Pest Management also involves the release of biological control agents, creating insectaries, such as has already occurred in the Moose Creek area of the Selway River to control spotted knapweed. Efforts are underway to create an insectary to control rush skeletonweed. Over the long term, these insectaries will increase to control spotted knapweed and rush skeletonweed in the Green Horse project area.

The proposed action would likely cause the spread of invasive species to some degree. However, invasive species are most likely to increase along roadways which can be easily monitored and treated. In addition, invasive species that are introduced to, or increase in density, proposed units post-harvest activities will eventually be replaced by native vegetation through succession and treated under the Early Detection Rapid Response (EDRR) protocol if identified as a high priority target species.

Cumulative Effects

In the short term, cumulative impacts from the planned activities would increase soil erosion resulting in increased areas of invasive plants. However, as noted above, IPM would be implemented prior to, during, and following activities causing soil disturbance and result in control of invasive plants.

In the long term, the reasonably foreseeable cumulative effects of the planned activities would decrease as invasive plants are controlled by the use of IPM. Also, wildfires create increased areas of bare ground, thereby increasing soil erosion and the potential for invasive plants to invade and occupy disturbed soil areas. The planned activities would create forest vegetation that is resistant to wildfires, thereby, reducing the potential for invasive plants to become established.

Past and present disturbances associated with vegetative treatments (grazing, recreation, fire), added to reasonably foreseeable actions (grazing and recreation), would create over the next 3 to 5 years a cumulative threat of weed expansion through distribution of weed seed, ground disturbance, and creation of spread pathways. The risk of weed expansion would be reduced with the implementation of the design feature and mitigation measure under the proposed action as disturbed surfaces recover to desirable vegetation.

Range

The project lies within a portion of American River grazing allotment where 115 cow/calf pairs are permitted to graze from June 17 to October 2. The area of the allotment where the Green Horse proposed action would occur is usually grazed during the fall months of the grazing season. Direct and indirect

effects were analyzed within the Green Horse project area and cumulative effects were analyzed within the entire American River allotment.

Direct and Indirect Effects

No Action

Under current management, range condition and trend are expected to remain stable, followed by a slow decline resulting from loss of forage availability due to conifer encroachment, and loss of transitory range.

Proposed Action

Under the proposed action, direct effects from silvicultural treatments on approximately 2,250 acres. All treatments (regeneration and intermediate harvest and prescribed landscape burning) would reduce access to forage within portions of the grazing allotment where active logging or burning would take place. Within 3 to 5 years, the indirect effect of the reduction in crown closures would result in an increase in transitional grazing opportunities by providing usable forage within treatment acres for about 20 years, with no adverse effects to other aspects of livestock management so as long as livestock can access the treated areas, and range improvements are protected.

Proposed activities may disrupt the timing and rotation for moving cattle between pastures both directly, while activities are taking place, and indirectly, through re-entry restrictions in the years following the activity. Annual Operating Instructions serve as methods to adjust for these potential impacts.

Cumulative Effects

No cumulative effects are expected by taking no action because there are direct or indirect effects of the Green Horse project. Other future foreseeable activities within the affected grazing allotment can potentially complicate allotment management while activities are taking place and following re-entry livestock grazing restrictions along with the Green Horse project is the Limber Elk project. As with the Green Horse project, there would be an increase in transitional grazing opportunities with usable forage available within treatment units.

Wildlife

Threatened Species under the Endangered Species Act

No analysis is required for the Canada lynx as no habitat is present in the project area. The grizzly bear is considered present on the Forest. The USFWS considers that such presence does not mean the area is considered occupied range, or that a project will automatically have significant effects (USFWS 2020). Therefore, the determination for the species in the Green Horse Project is No Effect to the grizzly bear (document 24-006). The proposed threatened status of the north American Wolverine was recently (October 2020) cancelled. The wolverine is analyzed under the sensitive species status below.

Regional Forester Sensitive Species

Sensitive wildlife species are those that show evidence of a current or predicted downward trend in population numbers or habitat suitability that would substantially reduce species distribution. Federal laws and direction applicable to sensitive species include the NFMA and FSM 2670. The Forest is required to determine the potential effect of proposed activities on sensitive species and to prepare biological evaluations. The Forest Service is bound by federal statutes (ESA, NFMA), regulations, and agency policy (FSM 2670) to conserve biological diversity on NFS lands and assure sensitive species populations do not decline or trend toward listing under the ESA. This document fulfills the requirements of the biological evaluation for sensitive species. The proposed action would not affect sensitive species

viability on federal lands, nor would it cause sensitive species to become federally listed as threatened or endangered.

Species Viability: The proposed action, in combination with and within the context of past, present, and reasonably foreseeable future management actions in the analysis area, would not affect population viability or distribution of native and desired nonnative vertebrate species on the Forest. At the Forest-wide scale, the Green Horse project would not disturb, agitate or bother populations to a degree that causes, or is likely to cause, a measurable decrease in productivity by substantially interfering with normal breeding, feeding, or sheltering behavior.

This analysis incorporates the effects on terrestrial sensitive species and fulfills the requirements for the Biological Evaluation, per direction pertaining to the Forest Service Manual 2600, Ch. 2670.

Habitat for the following Regional sensitive species occurs in the project: American wolverine, bighorn sheep, black-backed woodpecker, fisher, flammulated owl, fringed myotis, long-eared and long-legged myotis, gray wolf, mountain quail, western toad, and neotropical migratory birds. There is no suitable habitat for American peregrine falcon, black swift, common loon, long-billed curlew, harlequin duck, Townsend's big-eared bat, and Coeur d'Alene salamander; these species will not be analyzed.

Wildfires burned next to and within the north and east portions of the project area. Some species were more impacted by such fires, and this is explained in the analysis below. Cumulative effects will vary by species. Foreseeable projects include West Meadow Fuels, Limber Elk, and the Aerial Detection Survey Incorporated Roadside Maintenance project (ADSIRM) (a roadside hazard tree and road maintenance project).

Bighorn Sheep

Summer habitat for the sheep consists of isolated patches within and outside of the project area. About 70 acres are scattered within one half mile from the project area and about 156 acres are within the project area. The Green Horse project area was used for analysis of the sheep, as treatments would affect some habitat. The time frame for effects is about 5 years; the time for a shrub to provide forage for a sheep.

No Action

No impact to bighorn sheep or their habitat would occur under this alternative.

Proposed Action

About 4 acres of regeneration harvest would occur in six patches; the largest being less than 2 acres. The treatments would remove the tree overstory. Shrub habitat would replace the openings and would provide habitat for the sheep in about five years.

Direct and Indirect Effects

Less than three percent of potential sheep habitat would be affected by project treatments. Disturbance and short-term displacement could occur, and habitat is adjacent to each of the areas affected. The removal of tree overstory would provide more forage for sheep.

Cumulative Effects

Past activities of harvest and wildfire have occurred in the sheep habitat; however, the reduction of tree overstory has provided more open habitat for forage, as well as, improved an individual sheep's opportunity to detect predators. Early seral vegetation would consist of grass, herb and shrub species, which may persist up to ten years. The more open habitat would provide a sheep more time to react to the presence or arrival of a predator in a more deliberate manner.

Determination

Project activities may disturb or displace an individual bighorn sheep. Displacement habitat is available within and adjacent to the analysis area. The project may impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Black-backed woodpecker

The area of analysis is the project area. It is large enough to provide habitat for the life-cycle of numerous breeding woodpecker pairs and their offspring. The woodpecker is an irruptive species that is attracted to recently burned habitats or outbreaks of wood-boring beetles (Dixon and Saab 2000). The time span of the bird's presence in a disturbed area may be up to eight years (Hoyt and Hannon 2002; Dudley et al. 2012).

No Action

Combined habitat for the woodpecker is around 1,100 acres. Ongoing disease outbreaks and future fires would continue to provide habitat for the species in the project area. No action would not affect current black-backed woodpecker habitat.

Proposed Action

The proposed regeneration harvest in the project area would reduce about 68 acres of potential woodpecker habitat. Another approximately 572 acres of proposed prescribed landscape burns may kill some trees that are currently stressed or dying.

Direct and Indirect Effects

Proposed activities may disturb or displace individual black-backed woodpeckers. Less than 10% of available habitat would be affected. After the prescribed landscape burn treatments are implemented, beetles and other invertebrates would move back into the area to feed on any standing dead or dying trees. The duration of treatment effects is about 20 years. This treatment would create some recruitment or replacement habitat for the species. Regeneration harvest treatments would retain clumps of trees which would provide potential forage or nest habitat for the woodpecker. It may take another 5 years to restock trees in harvested units.

Cumulative Effects

The recent fires (Wash and Falls) would continue to provide habitat for the woodpecker for another 3-5 years. Therefore, the proposed burns would be important as potential recruitment of replacement habitat. The time frame for treatments and replanting may take about ten years. The Nez Perce National Forest Travel Management (DRAMVU) Project may reduce the number of roads in the project area or restrict motorized access to some roads currently available for firewood collection. This would retain more snags or decadent trees for potential woodpecker habitat and/or reduce the period of motorized vehicle use.

Determination

Project activities may disturb, displace, or harm an individual. The West Meadow Creek fuels project might create some snags outside of the Green Horse project area. The project may impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Fisher

Home range of a male fisher is around 22,190 acres, and about 10,970 acres for a female (Sauder and Rachlow 2015). The subwatershed scale (Hydrologic Unit Code (HUC) at a size 12 that is 10,000-40,000 acres) capture a fisher territory for the analysis area. In some cases, the subwatershed may be too small,

and is merged with an adjacent one. All activities (past, present, reasonably foreseeable or ongoing) in each subwatershed are evaluated along with the proposed actions of the project.

The project area intersects three subwatersheds that provide fisher habitat. O'Hara and Glover/Selway each provide enough habitat for a potential fisher territory. Horse Creek is small and lacks the quantity of habitat for a fisher territory. Therefore, it was merged with the adjacent Glover/Selway subwatershed) to achieve adequate habitat for a second fisher territory. The time frame for consideration of impacts on fisher habitat is about 40 years: the amount of time for a tree to reach the structure and canopy cover that offers habitat for the predator.

No Action

Past events have affected potential fisher habitat. About 1,100 acres in the project area were burned from wildfires in the past decade. Not all habitat was lost, but the fires were large and consumed large patches of forest. Timber harvest in the past 40 years occurred in about 900 acres. Both the fires and harvests were analyzed as non-fisher habitat and were considered in the analysis for fragmentation.

The existing condition for the O'Hara territory is 49.9% mature habitat and fragmentation at 5.1%. The Glover/Selway and Horse Creek territory is at 57.7% mature habitat and fragmentation at 5.8%. Each of the two territories contain habitat to support two females and one male territory each for a total of four females and two males.

The desired levels of habitat for a territory is 50% or greater of mature habitat, and fragmentation at or below 5% (Sauder & Rachlow 2015). In the existing condition, one potential territory contains the desired mature habitat level, while the other does not, and both are above the suggested level of fragmentation. No action would result in current conditions of mature habitat and fragmentation staying the same.

Proposed Action

In the O'Hara subwatershed proposed treatments would reduce fisher habitat by 311 acres. The intermediate and regeneration harvests would affect 268 acres of mature habitat, and 43 acres of general habitat.

The Glover/Selway and Horse Creek subwatersheds include the conditions of the Wash and Slide Wildfires of 2015 that is contributing to fragmentation and potential loss of habitat. The project proposes prescribed landscape burning in 252 acres, regeneration harvest in 1,245 acres, and intermediate harvest in 74 acres in the Glover/Selway and Horse Creek subwatersheds. The prescribed landscape burning would not impact fisher habitat, as the implementation would include favorable weather conditions for a low severity burn.

Upon completion of the treatments, the harvested units would be re-stocked with trees and all temporary roads would be fully obliterated.

Direct and Indirect Effects

The O'Hara subwatershed would experience a decrease in mature habitat to 49%, and an increase in fragmentation to 6.2%. The Glover-Selway and Horse Creek subwatersheds would see a drop in mature fisher habitat to 54%, and fragmentation would increase to 6.3%. Both territories would have an increase in fragmentation levels which means that increased open areas may alter or shift the fisher's movement patterns. This may affect foraging opportunities and avoidance of predators.

Mature habitat falls to just under 50% in the O'Hara subwatershed, but remains at acceptable levels in the Glover Creek-Selway and Horse Creek subwatersheds. Corridors of mature habitat remain after project treatments, which provide cover, hiding or escape areas, as well as foraging habitat.

Regeneration and intermediate timber harvest would reduce trees of the size class- 10 inches or greater diameter at breast height (DBH) that fisher prefer to use for resting, denning, and other activities. The

larger trees provide canopies for shade, a prey base of tree dwelling mammals and birds, cover from raptors, and access to escape from or avoid other predators. The reduction of such habitat may disturb, displace or harm an individual fisher.

Gopher baiting activity could cause fisher to temporarily avoid the project vicinity during implementation however, the limited timeframe (one day or less) of actual on-site time to conduct gopher control coupled with extensive habitat available for short term movements to avoid disturbance, results in negligible level of impact. The Pocket Gopher Control-Forestwide Decision Memo found that “strychnine does not accumulate in living organisms and breaks down rapidly in the environment, where it is subject to decomposition by microorganisms into non-toxic chemical elements. Research suggests a half-life for the strychnine in the bait lasts from two weeks to one month.” A finding of “the Absence of Significant Adverse Effects to Extraordinary Circumstances” was made for pocket gopher control in the Decision Memo (document 11-003).

Cumulative Effects

Wildfires occurred in portions of the analyzed territories. The O’Hara Creek territory was affected by the 2014 Johnson Bar Fire (980 ac) and the 2015 Wash Fire (160 acres). The Johnson Bar Fire Salvage Project harvested about 142 acres in burnt areas. However, the trees were dead or dying, and were unlikely to provide the canopy cover that fisher prefer. The salvage harvest did not remove fisher habitat. About 30 acres harvested in the 1980s has not reached the size or tree canopy to provide general habitat for the fisher and are considered as open habitat. The Red Moose Divide Salvage would reduce fisher habitat by 448 acres.

The Glover Creek-Selway and Horse Creek subwatersheds (merged territory) experienced over 17,000 acres of wildfire related to the Slide and Wash Fires of 2015. This was the acreage inside fire perimeters and does not represent a total consumption of all vegetation within the area. Harvests completed about 40 years ago are now close to consideration as mature fisher habitat. Such as the case for the Falls Creek timber sale (units completed in 1980 or 1981). The 180 acres of recovering forest is close to providing mature fisher habitat consisting of size class of 10” dbh and tree canopy cover at or 35% or greater.

Forty years after the project is completed, mature forest would return to the affected areas, unless other disturbances (man-made or natural events) occur.

The Nez Perce National Forest Travel Management (DRAMVU) Project may change access to roads or reduce the period of motorized vehicle use within the analysis areas. If motorized access is curtailed, road prisms would become overgrown with forest vegetation, and fragmentation levels would decrease for the fisher. All of the foreseeable vegetation projects would impact or remove potential fisher habitat.

Determination

Areas affected by project activities (harvest and roads) would provide at least 10% cover in a fisher territory; about 10-15 years post project completion. Forty years after the project is completed, mature forest would return to the affected areas, unless other disturbances (man-made or natural events) occur.

The noise and movement by man and machine, as well as removal of habitat would likely displace an individual fisher from the project area. Human presence would continue for up to 5 years of additional entries in the harvested units for fuels treatments, tree planting and road/trail obliteration. Contiguous fisher habitat is adjacent to the project area and provides displacement habitat for an individual to retreat to. A recent Forest-wide query calculated over 800,000 acres of fisher habitat on the Nez Perce National Forest (NPCNF 2018). Thereby, the forest would still maintain habitat for territories, forage, and shelter for the fisher. Project activities may disturb, displace, or harm an individual fisher. The project may impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Flammulated Owl

The analysis area is the project area because it is large enough to provide potential breeding habitat for the owl and forage for their offspring. The time frame is considered around 50-60 years for a tree to achieve the size and structure to provide potential habitat for the raptor.

About 72 acres of the owl's habitat is located within in the project area. The habitat consists of small patches of Douglas-fir mix forest; the largest is about 12 acres. Another 47 acres is within a half mile and is located outside of the project area. Habitat is situated in small patches in the east and southeast portion of the project area. One potential territory (about 124 acres of habitat; Groves et al.1997) is located in the eastern area of the project area. This territory contains about 50 acres of owl habitat.

No Action

Dry site vegetation is underrepresented in the project area. Some patches are near or adjacent to the project area, but they are relatively small and isolated. Larger patches and more contiguous habitat are available outside of the project area that ranges from one half mile to two miles away. The no action alternative would not alter habitat, so there would be no effect to the flammulated owl.

Proposed Action

Less than 10 acres of owl habitat would be affected by regeneration harvest in two locations. Regeneration harvest would occur in about 8 acres of the mentioned territory.

Direct and Indirect Effects

The harvest would remove about 14% of the potential habitat in the project area. The reduction of one acre of habitat occurs in an isolated 7-acre patch located in the southeast corner of the project area. The other 9 acres of treatment would occur along a currently closed road within the potential territory described above. Treatments and restocking of harvest units may take about 10 years.

Owl nesting habitat is adjacent to the treated areas and may be used as displacement habitat. The potential territory would lose about 18% of habitat, however adjacent habitat is present and available for a displaced owl. Project activities (noise, movement, disturbance, and removal of habitat) may disturb, displace or harm an individual flammulated owl.

Cumulative Effects

The Nez Perce National Forest Travel Management (DRAMVU) Project may change access to roads or reduce the period of use within the project area or restrict motorized access to some roads currently available for firewood collection. This action may provide for the retention of more snags or decadent trees for potential owl habitat.

Displacement habitat is present and available in the project area. It would take about 50-60 years for new potential habitat to return in the analyzed area. However, most of the owl habitat is outside of the project area, which indicates that these locations provide better conditions for owl nesting: dry sites, and lower elevations. The foreseeable West Meadow Fuels Project may produce some snags for potential habitat outside the project area.

Determination

Project activities may disturb, displace, or harm an individual flammulated owl. The project may impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Fringed Myotis

The area of analysis is the project area because it is large enough to provide habitat for bat roosts and foraging habitat. There is about 116 acres of potential habitat estimated in the project area. The largest

patch is about 12 acres in size (and also provides habitat for the flammulated owl). Besides two patches that are 9 and 11 acres, the other patches are small and isolated from one another across the project area. Time frame for the development of habitat and effects is 50-60 years which is the time for a planted seedling to achieve the tree structure that may provide habitat for a bat.

No Action

Under this alternative, no planned activities would occur. Therefore, there would be no impact to fringed myotis.

Proposed Action

No prescribed landscape burning would occur in fringed bat habitat. Activities that would affect bat habitat include intermediate and regeneration harvest. About 12 acres of fringed myotis habitat would be reduced by the treatments. Treatments and restocking of harvest units may take about 10 years.

Direct and Indirect Effects

Timber operations would create disturbance and loss of habitat for the species on 12 acres. Impacts to individual bats may be disturbance, displacement, or harm from the treatment activities. Displacement habitat is adjacent to all affected areas, except one patch that is less than one acre in size. Similar to the flammulated owl, this bat species would find more potential habitat at lower elevations and drier sites.

Cumulative Effects

The Nez Perce National Forest Travel Management (DRAMVU) Project may change the road access within the project area. Some current roads, open to motorized access, may be closed to such access by the new travel management direction. As snags or dead trees occur along these closed road sections, potential bat habitat would increase. The return of potential habitat may take 50 or more years.

Firewood collection would continue. This activity occurs mainly along open roads, as most participants select to use a vehicle to haul the wood home. Roads closed to motorized access seldom receive this activity; which allows snags or decadent trees to be retained for potential bat habitat.

Determination

Project activities may disturb, displace, or harm an individual fringed bat. The project may impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Long-eared and Long-legged Myotis

Modelled analysis shows about 7,614 acres of potential habitat for the bat species is in the project area. The habitat is fairly contiguous despite pockets of non-habitat. Potential habitat for the bats consists of large and older trees; which may require 80 or more years to develop.

No Action

Under the no action alternative, no planned activities would occur. Therefore, there would be no impact to the bat species.

Proposed Action

About 1,732 acres of bat habitat would be affected by prescribed landscape burning (311 acres), intermediate harvest (147 acres), and regeneration harvest (1,274 acres).

Direct and Indirect Effects

The landscape burn treatment is unlikely to affect bat habitat, but the activity would generate heat and smoke, as well as disturbance from human involvement. The timber harvests would remove potential trees that bats may be inhabiting. This treatment would reduce bat habitat by less than 19%. Snags would be retained according to silvicultural prescriptions. Riparian and other forested areas that are not proposed for treatment, would also retain snag habitat. Implementation of the treatments would occur over a period of years; thereby not all bat habitat in units would be treated in one season. All proposed activities have the potential to disturb, displace or harm an individual bat.

Treatments would reduce tree canopy cover and reduce potential habitat. As the understory recovers, forbs and shrubs would increase and offer habitat for insects and bugs. Plants that produce flowers would attract butterflies and moths, while the dead or dying trees would provide habitat for beetles and other bugs. Both butterflies and beetles are the preferred staple of the long-eared and long-legged bat's diet (Lacki et al. 2007). The pulse in bat forage would last until the tree canopy shades out the understory; about ten to fifteen years.

If harvest occurs during the winter season, bats would not be affected as they would be present in their wintering roosts in the southern part of the state.

The effects of firewood cutting would be the same for these bats as mentioned in the fringed bat analysis.

Cumulative Effects

The time frame for effects is 80 or more years, for a tree to provide roosting habitat. The Nez Perce National Forest Travel Management (DRAMVU) Project may change access or the timing of motorized access to roads within the project area; if motorized access is restricted on some roads that currently available for fire wood collection; this would retain more snags or decadent trees for potential bat habitat. The West Meadow Fuels project might create some habitat outside of the project area.

The project area is the analysis area, as it is large enough to host many bats for the summer migration season. The time period relevant to bat presence in the analysis area is late spring to early autumn: the period of their migration for richer food sources.

Firewood cutting would remain limited to the low mileage of road open to the public; which remains the same as the existing condition. Fire suppression would continue, which may reduce the loss of bat habitat to wildfire.

Determination

Project activities may disturb, displace, or harm an individual long-eared or long-legged bat. The project may impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Gray Wolf

Management of predation (including the wolf) is an important issue for elk managers in Idaho (IDFG 2014). The project area overlaps two Game Management units (GMUs) for elk. The GMU is used as the project area for the wolf. GMU 16 is considered at a moderate risk of wolf predation on elk, and the neighboring GMU 16A is considered as a high risk of such predation (IDFG 2017). Wolf management in GMU 16A may become more focused on reducing wolf occurrence.

No Action

Under this alternative, no planned activities would occur. Therefore, forest habitat would mature or increase, which would reduce browse available to elk. The wolf would likely adjust its location to where the elk are present.

Proposed Action

The project would modify over 2,000 acres of forest habitat with treatments that would provide potential forage for elk and other big game. The effort would increase forage over a span of about 10 years. The wolf would likely benefit from any increase in big game numbers, or concentrations of big game in the area.

Direct and Indirect Effects

The proposed action would not affect wolf habitat. Implementation of timber harvest operations (noise and movement by man and machine) may temporarily agitate or displace a wolf from the project area during periods of activity. A wolf may remain present or return to the project area, if or when big game are available. Wolves are known to return to harvested units during hours of darkness to hunt for prey. The project area is part of a larger elk analysis area, which meets the Forest Plan guidelines for elk habitat effectiveness (see Rocky Mountain Elk section below). All of the elk analysis areas are meeting the elk habitat effectiveness levels throughout the duration of project activities, except one (see Rocky Mountain Elk section below). The elk analysis area that is not meeting the elk habitat effectiveness levels was not at the recommended level in the existing condition; and the effects of implementing the project did not reduce the present elk habitat effectiveness. Additionally, project effects did not increase road densities in the Game Management Units nor change the current elk vulnerability levels in either of the GMUs.

Upon completion of the treatments, an increase in forage for big game would become available and persist for about 10 years, if no other treatments are conducted. Treatments and restocking of harvest units may take about 10 years. Concentrations of big game would continue to attract wolves, and the state may utilize control efforts on the predator in the project area.

Cumulative Effects

The area of cumulative effects for the wolf comprises two GMUs for elk as stated above. The time frame for effects is about 10 years; as this is when vegetation would recover from disturbances and have the potential to provide forage for elk and other big game. The same potential of forage for big game is present in future vegetation projects or wildfires. As mentioned, the predation potential for the two affected GMUs varies is at the level of predation risk to elk and big game. The Idaho Department of Fish & Game would determine management actions on the wolf.

One foreseeable project is the Nez Perce National Forest Travel Management (DRAMVU) Project. This project may reduce open road densities, which would be a benefit to elk habitat effectiveness. Wolves may benefit from road closures, as some hunters or trappers would not be willing to expend the energy to “take” a wolf that is a distance from their vehicle. Both the Limber Elk (timber) project and the West Meadows Fuels would create openings for big game. The increase in openings usually result in more forage for big game. Increases in big game benefits predators, such as the wolf. The ADSIRM is a road maintenance and hazard tree removal project that is unlikely to impact wolf habitat or prey base.

Determination

Project activities may disturb or displace an individual wolf. The project may impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Mountain Quail

Quail habitat consists of shrub or transitional forest (mixed tree, shrub, grass). The habitat model shows shrub habitat in the project area is about 285 acres, and 230 acres of transitional habitat. The transitional habitat is a mix of tree species and vertical structure. The project area is used as the analysis area for quail, as it supports seasonal habitat for the species. The time frame ranges between 10-15 years. Beyond that time frame, shrubs would likely decline under the increasing forest canopy.

No Action

Under this alternative, no planned activities would occur. However, without a fire or other disturbance, the shrub component would decline under the developing tree canopy. Forage for quail would decrease.

Proposed Action

Proposed treatments would affect 254 acres of quail habitat: about 132 acres would occur in mainly grass/shrub habitats, and 122 acres in transitional habitat (some tree presence). Most of the combined habitat would be treated by prescribed fire (183 acres).

Direct and Indirect Effects

Treatments and motorized activities are likely to disturb or displace a quail within proximity to the activity. Prescribed burns would set back small trees and shrubs. Timber harvest would reduce tree canopies and allow for understory recovery. About 5 years later, the understory vegetation would recover and provide forage for quail. Burns are likely to occur after the timber harvests are completed. Early seral tree species would be the preferred habitat type in these openings. More natural openings may be maintained through landscape burn treatments. As shrubfields develop, habitat for the quail would improve and increase. As mentioned earlier, the shrub component would begin to decline in 10 to 15 years under the new tree canopy.

Cumulative Effects

The Nez Perce National Forest Travel Management (DRAMVU) Project may decrease road prisms in the area. Vegetation recovery (5-15 years) in these abandoned prisms may provide more forage for the quail. The ADSIRM project may create some openings that support shrub habitats preferred by quail outside of the project area.

Determination

Project activities may disturb or displace an individual quail. The project may impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

North American Wolverine

The status of the wolverine has recently changed. The following was presented on the pertinent USFWS website for this Forest on October 8, 2020. The best available science shows that the factors affecting wolverine populations are not as significant as believed in 2013 when the U.S. Fish and Wildlife Service (Service) proposed to list the wolverine found in the contiguous United States as threatened. New research and analysis show that wolverine populations in the American Northwest remain stable, and individuals are moving across the Canadian border in both directions and returning to former territories. The species, therefore, does not meet the definition of threatened or endangered under the Endangered Species Act (ESA). Accordingly, the Service has withdrawn its listing proposal. (<https://www.fws.gov/mountain-prairie/index.php>).

Potential habitat for the wolverine is now modelled as primary, maternal, and dispersal habitats (Inman et al. 2013). Primary and maternal habitats are considered as highly likely to be utilized by the species as important habitat for denning, reproduction, forage opportunities and rearing of young. Dispersal habitat is considered as transitory habitat; and is not providing the quality of attributes as mentioned for the other habitat types transitory habitat is present in the Green Horse project area. The timeframe of effects is limited to when the project activities are occurring (within 20 years).

No Action

No activities would occur, nor habitat affected; therefore, no impact to the predator.

Proposed Action

Dispersal habitat is present within the entire the project area where all 2,260 acres of proposed treatments would occur. Time frame for effects is the duration of project activities.

Direct and Indirect Effects

Project activities would occur in both male and female dispersal habitat. Implementation of vegetation treatments may disturb or displace an individual wolverine; however, the activities would not disrupt mating, foraging or the establishment of home ranges for the predator.

Prey availability may shift in treated areas; from species that prefer denser vegetation to those that prefer more open habitats. This may result in an increase or availability of prey (rodents, rabbits, carrion on winter ranges) for a wolverine.

- Project activities would not contribute to the identified primary or secondary threats to the wolverine distinct population segment (DPS) (climate change, inadequate regulation of climate change, harvest, and small population size).
- None of the proposed activities are considered a threat to the DPS (USDI Fish and Wildlife Service 2013).
- The individual project activities and cumulative actions will result in relatively small-scale disturbances in relation to the large wolverine home range size, and wolverine are able to adjust to and co-exist with moderate levels of disturbance.

Cumulative Effects

Past activities of harvest and wildfire have occurred in the predator's habitat. However, the habitat has remained as dispersal habitat for transitory wolverines and as stated above has not been expected to disrupt mating, foraging or the establishment of home ranges for the predator. Recent findings show the species' North American population is stable and demonstrating ongoing movements between Canada and the USA. The Green Horse project would not change or affect the high elevation habitats or snow levels that the predator uses as transient habitat.

Determination

Project activities may disturb, displace or harm an individual wolverine. The project may impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Western Toad

The analysis for potential western toad habitat is split between breeding or upland habitats. Breeding habitat is considered as riparian areas and the buffers associated with them. About 1,028 acres are considered as toad breeding habitat. There would be no treatments in these areas.

Upland habitat consists of all areas outside of breeding habitat (about 8,520 acres). Therefore, the project area is the analysis area for the toad, as it contains all habitat necessary for toad survival and reproduction. Toads may be present on the forest floor, roads, trails, and intermittent puddles or pools.

No Action

Under this alternative, no planned activities would occur and there would be no effect to western toad or its habitat.

Proposed Action

The combined proposed treatments would affect about 2,360 acres of upland toad habitat. The timeline for analyzing effects would be during the operating period for activities (20 years).

Direct and Indirect Effects

Prescribed landscape burn treatments are planned in approximately 572 acres. A toad located in these treatment areas would likely perish, unless it is in a burrow, or moves safely away from the heat. Slash and pile burning would likely produce similar effects within the timber harvest units described next.

Timber harvest on approximately 1,688 acres may disturb, displace, or harm an individual toad during mechanized tree falling, skidding, or hauling operations.

Not all treatments would occur simultaneously in space and time. The 10-year time frame for effects on toads includes duration of road management, harvest treatments, slash disposal, and tree planting.

As treatments are completed, toads would likely return to forage on the invertebrates that are attracted to the woody debris or recovering vegetation. All temporary roads would be decommissioned, thereby reducing motorized traffic in the project area.

Cumulative Effects

The Nez Perce National Forest Travel Management (DRAMVU) Project may reduce access on some roads or reduce the period of motorized vehicle use. This could reduce some potential impacts from motorized traffic on the Western toad.

Determination

Project activities may disturb, displace or harm an individual toad. The project may impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species of the western toad.

Neotropical Migratory Birds

Migratory birds occur every year on the Forest. Their presence may be for a short period, such as a rest stop along the flight path. Or the period may extend for a longer period: breeding, raising young to adulthood, and preparing for the next migration. The project area would be considered as the analysis area for the species of migrating birds that use or prefer the habitat available within this boundary. Such species may vary from hummingbirds, seed eaters, insectivores and others.

No Action

Under this alternative, no planned activities would occur. Therefore, there would be no impact to the neotropical migratory birds.

Proposed Action

About 2,260 acres of potential habitat for migratory birds would be affected by the proposed action.

Direct and Indirect Effects

All proposed activities have the potential to impact neotropical migrants that elect to nest in the project area. The time frame of project impacts would be from April to September (breeding to fledgling periods in bird's life cycle) of each year the project is active. Treatments of timber harvest and prescribed landscape burning may disturb or displace a migratory bird. The creation of temporary roads or upgrading old roads may also create disturbance or displacement to a migrant bird. Treated areas would likely return to an earlier seral vegetation stage, which may not be preferred habitat for those species that nest and forage in mature tree habitats. The removal or burning of small trees would reduce nesting or foraging habitat for some migrants. Insectivores may be displaced from the area as their prey responds or adjusts to the changes in understory vegetation from the proposed treatments. Nectar sources may be reduced for hummingbirds. Ground nesting birds would likely be disturbed, displaced, or harmed. A wildlife

mitigation measure (WL-1) in Table 2 would limit proposed activities during the nesting season for migratory birds in some units.

However, species preferring understory vegetation (grass, herbs, shrubs) would likely benefit from the recovery of vegetation during the post treatment migration cycles. Insects, bugs, and nectar sources would likely increase in the newly opened or expanded clearings.

Upon completion of treatments, tree-planting would start early seral species as described under the Proposed Action and the Forest Vegetation sections, and temporary roads would be decommissioned. Completion of these activities is estimated at about 20 years. Shrubs and grass species would emerge in absence of a tree canopy. Over time, migrant bird use of the area would change from species that thrive in early forest, to those bird species that prefer a mixed forest of tree species, age, and structure.

Cumulative Effects

The Nez Perce National Forest Travel Management (DRAMVU) Project may reduce road densities. Abandoned or decommissioned road prisms would undergo succession of vegetation that would provide future habitat for different guilds of neotropical migrant birds. Firewood collection may reduce some snags that provide potential habitat for some migrant species.

Some snag habitat may be created with the West Meadows Fuel project outside of the project area. Both the ADSIRM and Limber Elk projects would create more open habitats which would be favorable to bird species that prefer such habitat. The project may impact individuals or habitat of neotropical migratory birds but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Nez Perce Forest Management Indicator Species (MIS)

Habitat for the following Forest Plan Management Indicator Species (MIS) occurs within the analysis area: American marten, Northern goshawk, pileated woodpecker, Rocky Mountain elk, and Shira moose.

American Marten

The American marten was identified as a Nez Perce National Forest management indicator species for trapped species and old growth forest. Idaho Department of Fish & Game manages marten populations primarily using licensing, harvest seasons, and harvest limits. Mandatory harvest reports include Catch-Per-Unit-Effort, which measures the harvest per unit of time and is useful in predicting population trends. Statewide trends for Catch-Per-Unit-Effort from 2002 to 2012 have steadily declined, from 4.14 to 2.15 (IDFG 2014).

Researchers estimated a marten home range in Idaho is about 905 acres (Shirk et al. 2014). About 5,055 acres of potential marten habitat is located in the project area. The analysis area for the marten is the project area; because it is large enough to support about 5 marten territories. Additional marten habitat is also located in areas adjacent to the project area and would offer habitat for a marten that may be displaced by the proposed treatments. The timeframe of effects is about 50-60 years which is the period for a newly planted tree to reach 15 inches DBH size class.

Research discussions on fragmentation of marten habitat is based on the amount of tree canopy cover; research studies ranged from 30% or greater to 73%. Most authors recommended at least 30% tree canopy cover (Koehler et al, 1975; Koehler and Hornocker, 1977; Hargis et al. 1999). The forest model selected 40% or greater canopy cover, based on Wasserman et al. 2012. The existing fragmentation (non-habitat and roads) of marten habitat in the project area is about 46%.

No Action

Under this action, vegetation would continue to recover from recent wildfires. As shrubs and young trees dominate these areas, potential forage (voles, mice, insects, berries) for a marten would increase. As the

tree canopy develops, squirrels and tree nesting birds would likely increase, and become available for the marten diet. The overhead canopy would present resting areas for the mammal and provide security from ground-based predators and some avian raptors. As the forest progresses in age and structure, downed woody debris would increase. Fallen trees and snags would present potential denning areas for the marten.

Areas of non-marten habitat (which includes about 82 acres of open and closed roads) comprise about 4,014 acres of the project area in the current condition. Many of these openings were created by previous timber harvests or wildfires. Current marten habitat would not be affected.

Proposed Action

A total of 1,758 acres of habitat would be affected by proposed treatments of prescribed landscape burning (315 acres), timber harvest (1,442 acres), and temporary roads (4 acres).

Direct and Indirect Effects

No stands managed for old growth or MA-20 would be affected by the proposed activities. Landscape burning would affect the understory; however, the prescription would maintain tree canopy cover of 40% or greater. Disturbance to a marten would occur during implementation of the landscape burn treatment, however, the tree habitat the mammal prefers would be retained.

Timber harvest activities and temporary roads in marten habitat would reduce potential habitat by 15% across the project area. The total fragmentation of marten habitat would increase to 61% across the project area.

The largest impacts to marten habitat from project activities would occur in two potential marten territories located in about the middle of the project area. Habitat reduction would be about 480 acres and 380 acres respectively. Both territories would experience a decrease in about 25% of marten habitat. The other three territories would experience fewer treatments, and less acres of impacted habitat.

During project implementation, timber operations (harvest, hauling, slash treatment or prescribed burns, and restocking of stands) may create potential disturbance (noise and activities by man and/or machine) that may agitate or displace an individual marten from the affected area.

Not all units in the proposed action would be treated at one time. Instead, timber operations would be separated into different sale packages, and implemented over a 5-year period each. Additionally, replanting of trees and road management would extend the time frame of disturbance to about 10 years. The proposed action may displace a marten from a former territory that has experienced a loss of contiguous blocks of habitat. Displacement habitat is available within and adjacent to the project area for a dislodged marten to seek shelter and food.

Cumulative Effects

The cumulative effects timeframe is 50 years or more for young trees to meet the canopy cover and structure as foraging habitat for the marten. It would take about 100 years for re-planted trees to reach the mature stage for resting or denning habitat for marten. Past timber harvests (1975-2015) have affected about 1,482 acres of potential marten habitat.

Recent wildfires that affected marten habitat include the Wash Fire (2015) and Falls Fire (2017). The Wash fire burned nearly 1,100 acres and the Falls Fire affected about 30 acres within the project area. Both events were of mixed severity and retained most of the marten habitat located within each fire perimeter. Similar to the fisher, about 226 acres of new forest habitat from the Horse Creek Timber sale would become potential habitat for the marten in about five years.

The Nez Perce National Forest Travel Management (DRAMVU) Project may reduce road densities that are contributing to some of the fragmentation in the project area. Roads designated for removal would potentially host tree habitat for the marten in about 50 years.

Upon project completion, fragmentation of marten habitat would have increased to 61%. This level is above the 40% of openings suggested by the researchers (Wasserman et al. 2012); the forest utilizes for modelled habitat. Such would likely be unfavorable for marten occurrence in most of the project area. Habitat is available in areas adjacent to the project area; and a displaced marten may move to such areas.

No stands managed for old growth would be treated by the proposed action. Marten population densities and trends are difficult to evaluate because long term data sets are rare, and populations often fluctuate, in large part due to variable trapping pressure. The IDFG manages for trapped species and adjusts the seasons and numbers of take.

Northern Goshawk

The northern goshawk was identified as a Nez Perce National Forest management indicator species for old growth forest. A 2005 survey of the frequency of northern goshawk presence in the Northern region found that based on a random sample (n=114) of 12,350 sampling units, goshawks were detected in 39% of available habitat in road-accessible areas in Region 1 (Kowalski 2005, Brewer et al. 2009). The results suggest that goshawks are relatively common and widely distributed in the managed portions of National Forest lands.

The Forest follows regional direction on the size of a goshawk home range of 5,000 acres (Brewer et al. 2009). The project area is large enough to host two of such ranges for the raptor. Within each home range are potential nesting territories, which are about 420 acres in size. The present amount of nesting habitat is about 7,447 acres and would support about 18 nesting territories. Most of the nesting habitat is concentrated in the southwest and northern portions of the project area, with adjacent nesting habitat outside of project area. The eastern portion of project area contains less nesting habitat; due to wildfires and past harvest activities.

No Action

Under this alternative, no impacts would occur to the goshawk or its habitat. Areas burned by wildfires would continue to recover; as burnt habitat is replaced with vegetation. Without further perturbations, the recovering areas would provide potential nesting habitat for the raptor in about 80-100 years.

Proposed Action

The proposed action would conduct the following activities in goshawk nesting habitat: prescribed landscape burn treatments (299 acres), intermediate harvest (140 acres), regeneration harvest (1,246 acres), and construction of temporary roads (one-half acre). Timber harvest would not occur in old growth.

Direct and Indirect Effects

Design features (to comply with Executive Order 13186; Migratory Bird Treaty Act (MBTA); 2016 Forest Service/Fish & Wildlife Service MOU; Regional Guidance; and mandatory contract provisions) for activities around an occupied goshawk nest would maintain a minimum 40-acre, yearlong no-treatment buffer, around a recently occupied goshawk nest tree. No ground disturbing activities shall be allowed inside known occupied post-fledgling areas (420-acres) from April 15 to August 15 would be applied to harvest activities (document 11-004; Brewer et al. 2009).

Project activities may disturb or displace an individual goshawk that is in or near treatments. Prescribed landscape burning would not reduce nesting habitat, as the large trees would not be affected by the low intensity burns. Intermediate harvest would remove dead or dying trees. The prescription would retain all other trees, which would include those mature trees that a goshawk prefers for nesting (document 11-004).

Regeneration harvest (1,246 acres) would reduce goshawk habitat by nearly 17%. Two potential territories may be reduced to the point where there is not adequate habitat to support a nesting pair. However, each home range has habitat for displacement and other potential territories. Project activities would generate noise and movement by man and machine. A goshawk within treatment units may be disturbed or displaced by such activity during the operating period. Displacement habitat is available within and adjacent to the project area. The period for treatments, replanting and road management would be about 10 years.

Gopher baiting activity could cause goshawks to temporarily avoid the project vicinity during implementation however, the limited timeframe (one day or less) of actual on-site time to conduct gopher control coupled with extensive habitat available for short term movements to avoid disturbance, results in negligible level of impact. Goshawk could potentially feed on gopher carcasses. However, studies have found no indications of secondary poisoning resulting from below ground baiting. The Pocket Gopher Control-Forestwide Decision Memo found that “strychnine does not accumulate in living organisms and breaks down rapidly in the environment, where it is subject to decomposition by microorganisms into non-toxic chemical elements. Research suggests a half-life for the strychnine in the bait lasts from two weeks to one month.” A finding of “the Absence of Significant Adverse Effects to Extraordinary Circumstances” was made for pocket gopher control in the Decision Memo (document 11-003).

Cumulative Effects

The cumulative effects timeframe is 80 years or more for young trees to meet the canopy cover and structure to support a goshawk nest.

Recent wildfires that affected goshawk habitat include the Wash Fire (2015) and Falls Fire (2017). The Wash fire burned nearly 1,100 acre and the Falls Fire affected about 30 acres within the project area. Both events were of mixed severity and retained some pockets of potential nesting and foraging habitat for the raptor. The Horse Creek Timber sale was completed in 1981, 188 acres of tree harvest has been replanted, and the young forest is providing forage habitat for the goshawk. The Nez Perce National Forest Travel Management (DRAMVU) Project may reduce road densities that could allow forest to return to the abandoned road prisms. Around 80+ years later, plant succession would host trees of the size and structure that could support a nest. Finally, no stands managed for old growth (as well as MA 20) would be affected by this project. Goshawks would remain common and widely distributed across National Forest lands.

Pileated Woodpecker

The pileated woodpecker was identified as a Nez Perce National Forest management indicator species for old growth forest and large snag habitat. Habitat estimates were derived from FIA data (The U.S. Forest Service’s Forest Inventory and Analysis Program Bush and Lundberg 2008). The Nez Perce National Forest has approximately 299,667 acres of nesting habitat and 444,789 acres of foraging habitat well distributed to support pileated woodpeckers (Bush and Lundberg 2008).

The project area contains about 2,594 acres of nesting habitat, about 5,134 acres of foraging habitat. A home range was calculated at 1,005 acres (Bull et al. 2007). Thereby, the project area would support about 9 breeding pairs of woodpeckers.

Nesting habitat concentration covers the southeast and central portions within the project area and would include adjacent nesting habitat outside of project. The eastern portion of project area contains less nesting habitat; due to wildfires and past harvest activities.

No Action

Under this alternative, no impacts would occur to the woodpecker or its habitat. Areas burned by wildfires would continue to recover; as burnt habitat is replaced with vegetation. Without further perturbations, the recovering areas would provide potential nesting habitat for the bird in about 80-100 years.

Proposed Action

Prescribed landscape burn treatments (327 acres) in the combined habitats would not likely impact trees of the size class of 10 inches DBH or greater; as burn prescriptions are for low to moderate intensities. Intermediate harvest would occur in nesting habitat (47 acres) and foraging habitat (104 acres). Regeneration harvest would reduce potential habitat in nesting (412 acres) and foraging (919 acres) habitats. The proposed treatments would impact about 459 acres of nesting habitat and 1,209 acres of foraging habitat.

Direct and Indirect Effects

Project activities would likely disturb or displace a woodpecker in the affected areas. Prescribed burns would reduce understory fuels but would retain forest habitat that the woodpecker uses. Intermediate harvest would target dead and dying trees, which is potential forage and nest habitat for the woodpecker. Regeneration harvest would also reduce habitat. The combined timber harvest prescriptions would reduce nesting habitat by 459 acres and foraging habitat by 1,023 acres. The time frame for treatments, re-stocking trees and road management is estimated at about 10 years.

The impact of the proposed timber harvest on nesting habitat in potential home ranges showed the most impacted areas were in the central part of the project area. Nesting habitat affected by harvest activities in three of these areas ranged from 70-82 acres. All the home ranges contain nesting habitat that would not be affected and would continue to offer habitat for a breeding pair of woodpeckers.

Cumulative Effects

The proposed harvest would reduce nesting habitat by less than 18% and foraging habitat by less than 20%. Displacement habitat would remain available within and adjacent to all home ranges in the project area.

The Wash Wildfire in 2015 reduced woodpecker habitat in the northeast portion of the project due to severe fire conditions. However, moderate fire intensities created habitat for the woodpecker and contributed to the existing habitat condition. Areas affected by the Horse Creek, Falls Creek, Stillman Cedar, and Stillman timber harvests are now young forest (30-40 years old) and are modelled as forage habitat for the woodpecker.

Foreseeable projects include management for roads, timber, fuels and safety. The Nez Perce National Forest Travel Management (DRAMVU) Project may reduce road densities, that could allow the recovery of forest on the abandoned road prisms. Additionally, any snags along these closed road systems would likely not be affected by firewood collectors as disclosed in the fringed myotis section.

Firewood gathering may impact potential woodpecker habitat. However, the activity would be concentrated along roads open to public motorized access.

No old growth in the project area would be impacted by the proposed activities. Snag habitat would be retained according to Appendix N in the Forest Plan that requires an average of 1.4 snags/acre; with one snag per 10 acres greater than 20 inches DBH (document 11-004). The time frame for disturbed areas to recover to potential woodpecker nesting habitat is about 80-100 year.

In summary, no old growth would be impacted by the proposed treatments. Snags would be retained according to the Forest Plan. The species is rated as not rare, and apparently secure in Idaho (Idaho Species Diversity Database, online, 2021).

Rocky Mountain Elk

Elk is a management indicator species for commonly hunted big game species on the Nez Perce Forest. The ungulate is a habitat generalist and uses a diversity of forest types and structures that provide forage and hiding cover. They use meadows and early seral communities for foraging in spring through early summer. Four elk analysis areas (EAA) overlap the project area. Most of the habitat is elk summer

habitat; however, two of the EAAs have some winter habitat that are Falls Creek (493 acres) and Island Creek (16 acres). The elk analysis is based on Servheen et al. 1997. The analysis areas occur in portions of two Game Management Units (GMUs). The Falls Creek, Island Creek and Saddle Creek EAAs are within the Elk City GMU (16) and the Horse Creek EAA is in the Selway GMU (16A).

No Action

No impact to elk would occur as no activities are planned under this alternative. In the existing condition, all of the EAAs are meeting their targeted elk habitat effectiveness (EHE) except for the Island EAA. This EAA has low road densities, but also a low representation of openings, which are considered as potential forage areas for elk.

Proposed Action

The proposed treatments would occur in elk habitat are prescribed landscape burning (572 acres), intermediate harvest (178 acres), and regeneration harvest (1,510 acres). About 2.5 miles of temporary road are planned for access to regeneration harvest units. Additionally, about 2.5 miles of temporary road would be constructed for access to treatments or hauling activities.

Direct and Indirect Effects

Prescribed landscape burning (572 acres) would likely disturb or displace an elk in the area of such activity. The treatment would reduce small trees and shrubs. However, the timing and execution of the burns would not affect larger trees in the units. The understory would recover in the following seasons and provide forage for elk and other big game for up to 10 years.

Both timber harvest treatments would reduce tree canopy and provide more sunlight and nutrients for elk forage. New openings created by treatments would provide elk forage for approximately 10 years. Patches or strips of vegetation would be retained to keep openings less than 40 acres in units 19, 20, and 21. This action would break up the openings and would provide some hiding cover and potential movement corridors for elk.

About 78 acres of regeneration harvest would occur in elk winter range. Mitigation measures would restrict activities during the winter and spring seasons, in order to reduce effects on big game during periods of low forage availability and the calving season for units 18, 19, and 20 (Table 2).

Road densities would increase due to access to treatment areas because of opening of closed roads and creation of temporary roads. However, not all activities would occur at once, and not all roads would be used at the same time. Temporary roads would be decommissioned and would not contribute to motorized access once project activities are complete.

Temporary roads and roadside harvest treatments (regeneration or intermediate) create or increase forest openings. Such openings along roads may affect road densities as a road section that is along an opening is evaluated at a higher co-efficient than a road bordered by vegetation. This change in EHE is never permanent. The post action EHE value does not reach that of the existing condition in the Falls, Horse, and Saddle EAAs due to the increased openings along open roads. However, all three EAAs meet the Forest Plan EHE of 50%. Closed roads that were opened for treatment activities, would be returned to a closed status upon completion of the project. All treatments, planting, and road management activities would occur in a period of about 10 years.

Units that create openings along roads, may provide opportunities for a hunter or other predator (wolf, cougar, bear) to detect and take an elk for the short term, until the understory begins to provide cover (5 years) and then the planted trees (10-15 years).

The elk habitat effectiveness for each EAA is calculated by combining the effects of motorized access (roads & trails), cattle presence, openings, cover, and security areas (documents 24-001 – 24-004;

Servheen et al. 1997). The elk habitat effectiveness (EHE) is at, or greater than the Forest Plan standard for each EAA (Table 6); with the exception of the Island EAA that remains at 71%, below the 75% EHE standard; but the EAA does not decrease from the existing condition.

Table 6. Elk analysis areas (EAAs) in Green Horse project area.

	Falls EAA	Horse EAA	Island EAA	Saddle EAA
Forest Plan Elk Habitat Effectiveness (EHE)	50%	50%	75%	50%
EHE (%)				
Existing/During/Post	53/ 50/50	68/ 66/ 66	71/ 71/ 71	66/ 61/ 61
Openings (%)				
Existing/During/Post	5/ 18/ 18	10/ 14/ 14	5/ 8/ 9	4/ 13/ 13
Road Density (mi/mi²)				
Existing/During/Post	1.1/ 1.3/ 1.3	0.5/ 0.6/ 0.6	0.4/ 0.4/ .04	0.5/ 0.7/ 0.7
*Potential Elk Use Related to Cattle Density (%)	98% through all Project stages	98% through all Project stages	98% through all Project stages	98% through all Project stages

* The potential elk use (98%) related to cattle densities does not change; which shows that cattle densities are low, and likely providing little to no competition with elk. All but one EAA is meeting or greater than it's targeted EHE value. Openings increase potential forage, and road densities slightly increase or remain stable.

Elk Vulnerability (EV)

IDFG states that the elk population in the two Game Management Units (GMUs) have experienced declines in elk presence due to high predation and declining habitat due to invasive weeds. Predator control is also mentioned, but this effort is outside of Forest's management.

Potential impacts of project activities on elk vulnerability were calculated at the Game Management Unit (GMU) scale. Attributes considered for EV include roads and trails open to public access, and hunter densities during the fall hunting season. The Forest Service does not manage hunter densities. The hunter density has not been updated on any consistent basis, so the existing density was used in the model. The project treatments would occur in portions of two GMUs.

The Horse Creek EAA is part of the 279 square mile Selway Zone (GMU 16A). The total open motorized road and trail density is estimated at 0.3 mi/mi² in the existing condition. The Green Horse Project would open about 4 miles of currently closed roads and/or temporary roads for treatments in the Horse Creek EAA. The additional road mileage during the project implementation phase was too small to provide any change in the present density of open motorized routes within the GMU. The project would create about 203 acres of new openings that would offer potential forage for elk. Effects of invasive species were analyzed in this EA and cattle presence is low and likely limited on or adjacent to roads.

The other three EAAs affected by the proposed project are located in the Elk City GMU (16) that is about a 388 square-mile area. The total open motorized road and trail density is estimated at 0.7 mi/mi² in the existing condition. The Green Horse project would open about 22 miles of currently closed roads and/or temporary roads for treatments in the affected EAAs. The additional road mileage during the implementation phase is less than 0.04 mi/mi².

The proposed activities would require a periodic increase in road access by opening closed roads or creating temporary roads. Such roads are not open for the general public access. The project would create about 1,500 acres of new openings that would offer potential forage for elk. Forest openings would

provide forage for elk over a short time span (about 15 years). Elk vulnerability is not expected to measurably increase unless IDFG desires to harvest more elk. Cattle presence is low, as shown in the EAA spreadsheets where potential elk use related to cattle density is 98% in all of the EAAs. Weed presence competes with or reduces potential elk forage. More specific information on effects of invasive species is located in the Invasive Species section.

Predator control and elk harvest is managed by IDFG that determines the harvest tools (archery, rifle, traps, bait, etc.) and seasons for each. This project would contribute potential elk forage in the affected units for up to 15 years after the treatment and assisting IDFG's goal of replacing declining habitat for elk.

Cumulative Effects

The Wash Fire (2015) contributed to the reduction of overstory habitat in areas of moderate to high severity. However, overhead photography showed large areas of canopy still persisting at the time of this analysis. Timber projects in the past 20 years show the recovery of tree habitat in many areas, that now provide hiding cover for an elk. For those projects older than 20 years, such cover is apparent.

The proposed roads for access to treatment areas in the project area would increase road densities by more than 0.04% in the affected GMUs, during the implementation phase. Therefore, the lack of measurable change suggests that elk vulnerability in the affected GMUs is unlikely to change from the present condition. The elk analysis is meeting the guidelines of Servheen et al. (1997) for three of the EAAs. The Island EAA is below the desired 75% EHE in the existing condition. Project activities would not reduce the EHE level. As time passes, the dead or dying trees in burned areas will fall to the ground in the Island EAA. New openings in the forest would occur or present openings would expand. This would create an increased forage opportunity for elk. Current cattle densities are expected to remain the same as the current condition of on-going cattle grazing. Considering ongoing and future livestock grazing, potential elk use of forage would remain high (98%).

The foreseeable projects would remove or reduce the tree overstory, thereby creating a potential increase in forage for elk. The West Meadow Fuels Project encompasses about 195 acres of potential acres in the Horse Creek EAA that may be treated by prescribed fire. The Nez Perce National Forest Travel Management (DRAMVU) Project may reduce the number of roads in the project area; and generally, a decrease in road densities would benefit elk security. The Limber Elk Project may harvest another 33 acres next to a 36-acre Green Horse unit. Both projects would create an opening, that would offer about 3-10 years of understory vegetation that contribute to new forage for elk. The ADSIRM project proposes to remove dead and dying trees along road systems. The project would occur along 3 miles of road that is open to motorized access in the Falls Creek EAA. About one-half mile of an open road in the Horse Creek EAA is projected to be treated by the project. The project would disturb or displace elk during the project implementation. However, these openings may contribute to a potential decrease in elk security in the affected areas.

In summary, the proposed activities would not reduce elk habitat effectiveness to the levels below the suggested guidelines for the Forest. Upon completion of the treatments, road densities would decrease to the existing condition, new openings would increase elk forage opportunities, and elk vulnerability would not increase. The project would contribute to a short-term (1-15 years) increase in elk forage.

Shiras Moose

The moose is an indicator species for big game and mature grand fir with a Pacific yew understory. Potential moose habitat in the project area is about 6,009 acres. Forest Plan management area (MA) 21 (potential old-growth and yew habitat) contributes to 1,174 acres of the above habitat. The majority of MA-21 is located as a connected patch in the southern portion of the project area.

No Action

No impact to moose would occur as no activities are planned under this alternative.

Proposed Action

Project activities in MA-21 are approximately 1.5 acres of regeneration harvest and one acre of intermediate harvest. No yew would be affected, if it is found it would be buffered from treatments (see Silvicultural Treatments section under the Proposed Action).

The proposed treatments would affect general moose habitat as follows: prescribed landscape burning (294 acres), intermediate harvest (129 acres), and regeneration harvest (1,083 acres).

Direct and Indirect Effects

Project activities would disturb or displace an individual moose that is in or near treatments. Prescribed fire would temporarily reduce moose habitat consisting of shrubs and small trees. Temporary roads would reduce potential moose habitat in less than 3.5 acres.

Intermediate harvest would remove dead or dying trees. Regeneration harvest would reduce live and dead tree habitat. Both harvest treatments would contribute to the loss of shade/hiding cover, as well as reduction of shrubs in slash treatments. Indirect effects may be loss of retained shade-tolerant shrubs due to the removal of the tree overstory. Project activities would generate noise and movement by man and machine. Treatments, restocking of trees, and road management activities would occur over a period of about 20 years.

Cumulative Effects

Proposed activities would reduce general moose habitat by 25% in the project area. Past fires affected about 1,100 acres of moose habitat in the area. Most notably the eastern portion of the project area (about 800 acres) is fairly open from fire and timber events. Overhead photos of the Wash Fire show many trees are standing and canopy cover is still evident in many of the areas. Timber projects in the past 20 to 40 years now host tree habitat, which is providing hiding cover for a moose. Recovering vegetation in areas of wildfires (8-30 years ago) would likely support forage (shrub habitat) for moose.

The DRAMVU Project may reduce the number of roads in the project area. This would reduce disturbances to moose along the closed road prisms.

Project activities may disturb or displace a moose. No treatments would occur in stands managed for old growth and if Pacific yew is present in the understory, it would be considered for a retention clump or patch for wildlife. Though some reduction of grand fir may occur, moose habitat is located across the project area, and provides shelter and forage for a moose that could be displaced by project activities. Moose are hunted in Idaho under the management of the IDFG.

Soils

Detailed information regarding the effects analysis for the soil resource, including analysis methodology, calculations of detrimental soil disturbance (DSD), soil stability data, and references can be found in the in the project record.

No Action

Under the No Action alternative, no timber harvest, prescribed fire, or temporary road construction would occur; therefore, there would be no effects to the soil resource. The existing condition (document 04-014 p. 23) would be maintained. Current estimated levels of detrimental soil disturbance (document 26-001, 'Estimated') would persist in the short term, and natural soil recovery would likely occur in the long term,

barring any naturally occurring disturbances (landslides, wildfires). Current soil erosion and landslide potential would remain roughly the same in the short term. If a high severity wildfire were to occur, soils may experience both increased erosion and landslide potential due to loss of stability provided by vegetative cover and decreased soil productivity due to loss of topsoil and organic matter.

Proposed Action

Direct and Indirect Effects

Potential direct and indirect effects to soil productivity from all proposed activities include an increase in new Detrimental Soil Disturbance ranging from 2-11 percent per activity unit, based on the harvest method proposed and the distribution of proposed temporary roads within proposed harvest units (document 26-001, 'ProposedAction'). For a discussion of the factors that contribute to DSD, as well as the relationship between soil productivity and DSD, see the Soils Analysis Supplement (document 26-003, pp. 2-3). The proposed project Design Features (document 11-004) and mitigation measures in Table 2 would assist in minimizing activity impacts to soil productivity in all activity units.

Direct and indirect effects to soil stability can result from the increased risk of mass movement and erosion following removal of topsoil and stabilizing vegetation on high-risk landtypes. Increases in the extent of ground-disturbing activities (timber harvest, prescribed burning, temporary road or swing trail construction, and site-preparation activities) on high-risk landtypes correlate with increased erosion and mass movement risk. Roughly 143 acres (six percent) of the proposed units are situated on terrain that spatial modeling suggests is landslide-prone, and no temporary roads are proposed on landslide-prone terrain. A PDF map of potential landslide-prone areas can be found in the project record (document 26-004). Landslide-prone areas would be field-verified and temporary road locations reviewed during unit layout; these areas would be buffered out of the treatment units if found to be unstable, using the indicators described in the Soils Analysis Supplement (document 26-003, p. 3). Approximately 44 acres (2%) of the proposed activity areas are situated on soil types that are rated as high risk for surface erosion. The project Design Features (document 11-004) will aid in minimizing erosion in the project area. No proposed temp roads occur on soil types that are rated as high risk for surface erosion.

Approximately 92% of the proposed project units contain a surface layer of Mazama volcanic ash-influenced loess ranging from 7-20 inches in depth. Loss of this ash-influenced surface layer to erosion or mass wasting could be especially detrimental to the productivity of the soils in the project area, as the ash is highly favorable to plant growth due to its permeability and ability to retain moisture and nutrients. All project activities include BMPs, design features or rehabilitative measures to avoid irreversible and irretrievable commitment of resources on the productive land base. Mitigation measures such as keeping disturbance within the 20% Forest Plan standard and reusing existing skid trails are intended to avoid loss of the ash cap soil. Decommissioning of temporary roads and skid trails, which includes recontouring and recovery of excavated ash cap topsoil, is expected to initiate recovery of soil productivity functions over time.

All effects to the soil resource are site specific and would be contained within harvest units and associated skid trails and landings. Effects to the soil resource would likely persist for several decades (document 26-003, p. 2).

Cumulative Effects

Past activities in the project area that have impacted the soil resource include timber harvest, associated skid trail construction, temporary road construction, and fuel management activities. The temporal and spatial boundaries for cumulative effects are the same as those for the direct and indirect effects; thus, all ground-disturbing activities that occurred in the past 40 years and that spatially overlap the proposed project units were considered in the calculation of cumulative Detrimental Soil Disturbance (document 26-003, p. 2). Cumulative effects to soil productivity are summarized in the DSD Calculations spreadsheet (document 26-001, 'Proposed Action').

All units are expected to comply with Forest Plan standards following the completion of all project activities. DSD estimates based on geospatial data modeling suggest that two units (unit 02A and unit 03A) would experience cumulative DSD exceeding the 20% maximum DSD Forest Plan Standard; however, legacy skid trails will be reused and rehabilitated in these units to lower the DSD and ensure compliance with the Forest Plan (see Silvicultural Treatments under Proposed Action). These units were surveyed in August of 2020 to field-verify the extent and causes of previous harvest impacts and were found to have similar extents of DSD as predicted by the model (document 26-002, 'Summary'). The existing DSD in these units is a result of compaction and forest floor removal in areas of residual linear disturbances on the landscape. These linear disturbances appear to be legacy skid trails from tractor logging completed in the late 1980s. Reuse and subsequent rehabilitation (includes scarification and recontouring, if skid trails are excavated) of these legacy disturbances (document 11-004) would serve to improve soil conditions in these units and lower the cumulative project DSD in these units to a level below the 20% standard. A minimum of 0.5 miles of legacy disturbance would need to be reused and then rehabilitated in each of these units in order to meet the forest plan DSD standard of 20% (document 26-001, 'Summary'). Because reuse of existing skid trails is standard practice, at least 0.5 miles, but likely greater than 0.5 miles, of legacy skid trails will be reused for harvest, thus resulting in a cumulative DSD below the 20% forest plan threshold once rehabilitation has been completed. Additionally, it should be noted that these units would only be harvested if significant tree mortality is found during unit layout.

There are no expected cumulative effects to soil stability.

Watershed

Spatial and Temporal Extent

The Green Horse Project is located primarily within three subwatersheds (HUC 12, 6th level HUCs): Glover Creek-Selway River Watershed, O'Hara Creek, and Horse Creek. In addition, there are just over 30 acres of proposed roadside treatment in the American River Subwatershed. Within these four Subwatersheds are 7 Forest Plan Prescription watersheds (HUC 14, 7th level): Lower O'Hara Creek, Saddle Creek, Wart Creek, Island Creek, Falls Creek, Upper Main Horse Creek, and Upper American

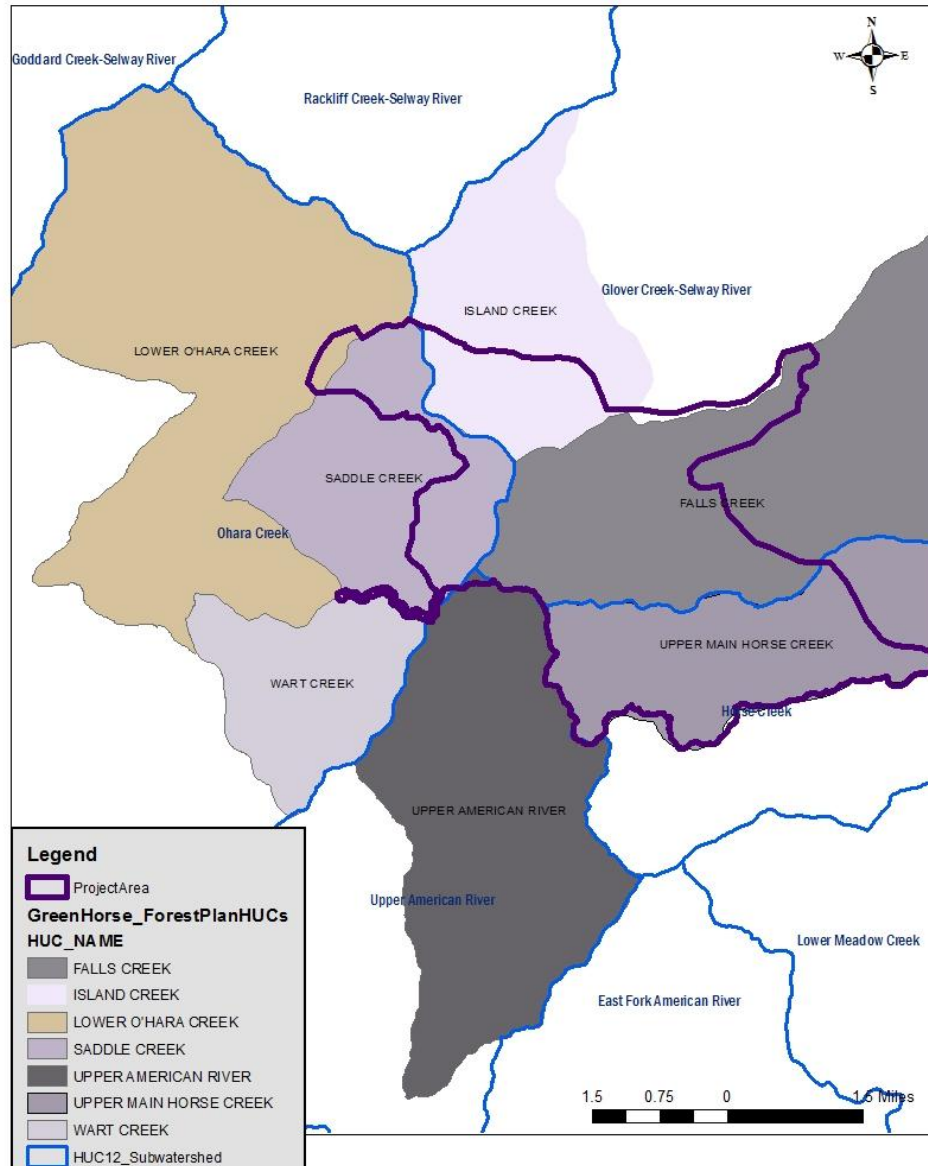


Figure 4. The four HUC 12 subwatersheds and seven Forest Plan prescription watersheds comprising the analysis area for water resources

River (Figure 4).

The existing condition and the possible direct, indirect and cumulative effects of the proposed activities on watershed resources are analyzed at the Subwatershed (HUC 12) scale. The seven Forest Plan

watersheds, in addition to 3 Forest Plan watersheds within O'Hara Creek serve as the scale for the required sedimentation analysis using the NEZSED cumulative effects model (document 28-004).

The temporal scale of the analysis for direct, indirect, and cumulative effects ranges from 1980 to 2050. The potential for short-term increases in erosion and sediment delivery associated with harvest and road decommissioning would last as long as soil is disturbed or exposed. Once vegetation and groundcover have stabilized disturbed ground surfaces, sediment related impacts would not be expected to persist.

No Action

Under the No Action alternative, no timber harvest, prescribed fire, or temporary road construction would occur; therefore, there would be no increases over natural sedimentation or increases to water yield from proposed actions; therefore, there would be no effects to water resources. The existing condition (document 04-014) would be maintained.

Proposed Action

The proposed harvest, fuels treatment, road construction, road reconditioning, and log hauling have the potential to impact water yield through the removal of overstory vegetation and degrade water quality through increased erosion and sedimentation. There are no activities proposed in riparian areas that would alter existing canopy cover in our designated Riparian Habitat Conservation Areas; consequently, water temperature was excluded from the analysis on water quality.

Direct and Indirect Effects

Water Yield

The forest structure of the Glover Creek-Selway watershed changed following the 2015 wildfires. The scale (total number of acres burned that altered living canopy) did result in subwatershed-scale increases in water yield, which are still evident today with the higher existing water yields as evidenced by an existing ECA of nearly 18%. The watershed continues to recover following the 2015 fires with post-fire increase in water yield attenuating.

The proposed regeneration harvest, proposed fuel treatments, and road building influence the potential changes in water yield with proposed intermediate harvest having no measurable effect (Table 7). The levels of proposed harvest and fuels treatment comprise small percentages of the total watersheds and will have little impact on water yield at this scale. The changes in water yield from proposed actions will have no effect on the stability of the perennial stream channels and will not alter the water runoff in quantity or timing of the project watersheds.

Table 7. Project related increases in ECA for each HUC 12 subwatershed

HUC_12	HU_12_NAME	Acres	Acres Forest Service	Existing Total % ECA	Project % ECA
170603020404	Ohara Creek	37880	37880 (100%)	5.85	1.7
170603020402	Glover Creek-Selway River	29019	29019 (100%)	17.93	4
170603020306	Horse Creek	9618	9618 (100%)	7.42	4.2
170603050201	Upper American River	15259	15114 (99%)	2.59	0.2

Water Quality

The water resources effects summary organizes the Effects analysis by each subwatershed and by project activities of harvest, fuel treatments, and temporary road construction. Effects related to road reconstruction, maintenance, reconditioning, and log hauling effects will follow at the end combined for the four subwatersheds. Table 8 provides some summary information about proposed actions.

Table 8. Proposed activities in subwatersheds and Forest Plan prescription watersheds

Drainage- HUC 12 and Forest Plan Watersheds	Total Acres	Proposed Regeneration Harvest	Proposed Intermediate Harvest	Proposed Landscape burning	Road Density (mi/mi²)	Proposed Temporary Roads (miles)
Ohara Creek	37899	247	97	312	1.3	0
<i>Lower O'Hara Creek</i>	9608	31	3.5	0		--
<i>Saddle Creek</i>	3688	216	94	314		--
<i>Wart Creek</i>	2468	3	0	0		--
Glover Creek-Selway River	29031	913		253	1.1	1.7
<i>Island Creek</i>	3866	35	0	32		0
<i>Falls Creek</i>	7582	888	5	220		1.7
Horse Creek	9622	332	55	0	1.3	0.6
<i>Upper Main Horse Creek</i>	4304	332	55	0		0.6
Upper American River	15266	18		8	1.7	0
<i>Upper American River</i>	6476	18	6	8		--

O'Hara Creek Subwatershed

Proposed actions are limited within the O'Hara Subwatershed and concentrated within two Forest Plan prescription watersheds Lower O'Hara Creek and Saddle Creek. There are also a few acres of proposed actions that cross the watershed divide into the Wart Creek prescription watershed. At the subwatershed-scale less than 1% of the watershed will be impacted by proposed harvest and fuel treatment. Likewise, at the Forest Plan watershed-scale (generally 7th Level HUCs), proposed actions account for less than 1% of Lower O'Hara prescription watershed. Harvest activities impact a little less than 6% of the Saddle Creek watershed and proposed fuels treatment impacts about 8.5% of the watershed. The proposed regeneration harvest will occur along the existing system road corridor and the fuels treatments will buffer out from the harvested road corridor. No activities are proposed on landslide prone terrain.

NEZSED modeling results, which are reported in cumulative effects show that both the Forest Plan Watersheds (also called prescription watersheds) are in compliance with the Nez Perce National Forest's Forest Plan guidelines for allowable sedimentation thresholds. The NEZSED model was run for the true O'Hara Creek watershed which takes into account the existing condition of an additional three Forest Plan watersheds: East Fork O'Hara Creek, West Fork O'Hara Creek, and Hamby Creek.

The proposed actions will have no direct or indirect impact on the water quality the streams within the O'Hara Creek Subwatershed.

Glover Creek-Selway River Subwatershed

The majority of proposed actions occur within the Glover Creek subwatershed. The project proposes regeneration harvest over about 3% of Glover Creek and fuels treatment over less than 1% of the watershed. There are two Forest Plan watersheds within the Glover Creek Subwatershed that will have proposed actions: Island Creek and Falls Creek. Based on the most recent data in 2014, Island Creek Prescription Watershed does not meet Forest Plan Water Quality objectives and an Upward Trend Analysis follows as an Appendix to the EA to show that existing condition will remain on a recovering trend following proposed actions. For both prescription watersheds, the primary factor influencing existing condition and current water quality trajectories is wildfire. In 2015, approximately 72% of the Island Creek watershed burned but with only about 16% of the watershed impacted by moderate and severe soil burn severity. Nearly 60% of the Falls Creek watershed burned in 2015 with about 27% of the fire impacted areas classified as moderate to high soil burn severity. Field visits in 2016, 2017, and 2020 show all burned areas have vegetation recovery with strong response by grasses, forbs, and native shrubs. Surface erosion is no longer evident in burned areas, though the streams are continuing to process and flush the post-fire sediment. Current research agrees that erosion and risks and post-fire landslide risks attenuate with the recovery of understory vegetation (Robichaud 2020; Robichaud 2013; Cannon et al. 2010). Wildfire is a natural process in these fire-adapted watersheds and the impact of fire on vegetation structure and stream sediment loads will continue to influence hydrological and ecological function in these two watersheds for years in the future. The existing sediment loading in both these watershed remains well below Forest Plan guidelines and thresholds of concern.

Regeneration Harvest and Fuels Treatment: Less than 1% of Island Creek will be impacted by proposed harvest and fuels treatment. Activities will be concentrated along two existing system roads with the emphasis on road safety. By contrast, regeneration harvest will occur more extensively in Falls Creek. Approximately 12% of Falls Creek will have regeneration harvest and proposed fuels treatments will impact about 3% of the watershed.

The harvest proposed in Island Creek is limited and focused on maintaining the road corridor. The harvest along the road of Island Creek occurs on ridgetop roads with no water crossings. No impacts will occur to water quality in the Island Creek drainage as a result of harvest and fuels treatments.

Sedimentation into Falls Creek as a result of harvest and fuels activities is possible, though should be mitigated by extensive riparian buffers. A combination of steep terrain and the more extensive regeneration harvest increases the chance of sedimentation resulting from harvest actions. Approximately 27% of the proposed regeneration harvest occurs on potential landslide prone terrain. All field verified landslide prone terrain will be dropped from the project and PACFISH buffers maintained around the higher risk areas. The key units where landslide prone terrain may occur are NEPA Units 18, 19, 20, 21 which are along FS Road #9714. Avoiding harvest on landslide prone terrain will mitigate risk of sedimentation resulting from increasing slope instability following harvest actions. Research concurs that maintaining riparian buffers is highly effective at mitigating sedimentation from harvest (Cristan et al, 2016). WEPP modeling results for the Units with proposed groundbased methods show that on average no sedimentation off the hillslopes is predicted; however, in a higher precipitation event approximately 0.15 tons/acre would be delivered off the unit to a riparian buffer.

Temporary Road Construction: Approximately 1.7 miles of temporary road construction will occur with the proposed action in Glover Creek and all of that within the Falls Creek watershed. The proposed roads will not be built on landslide prone terrain and there are no water crossings. Temporary roads outside the units are added into NEZSED as new road constructions and sedimentation estimated from construction. NEZSED assumes in the increased erosion factor for tractor harvest systems that temporary roads and skid trails are within units. Given none of the proposed temporary roads will cross live water and that the locations of the roads will be on the ridges with no connection points to stream channels there should be no direct or indirect impact to water quality through sedimentation from the temporary roads.

Project design criteria requires that temporary roads will be fully recontoured at the end of the project work.

Horse Creek Subwatershed

The project proposes regeneration harvest over about 2.5% of Horse Creek subwatershed and only 55 acres of intermediate harvest. No prescribed landscape burning treatment is proposed. The proposed harvest falls completely within the Upper Main Horse Creek prescription watershed, which is about half the area of the HUC 12. Just under 8% of Upper Main Horse watershed has proposed harvest. Harvest areas are primarily along Forest Roads with a few larger units. Two of the Units have some risk of sedimentation into tributaries of Horse Creek, Unit 17 and Unit 23. Both units have shallower slopes and will have ground-based harvest systems. Unit 17 falls primarily in the Falls Creek drainage, but the southern part of the Unit extends into Upper Main Horse Creek south of Forest Road #443. A portion of the Unit crosses an RHCA. PACFISH buffers will remain in place and no activities will occur in the RHCA and the harvest activities should have no direct sedimentation into live water. Unit 23 is off Forest Road #2116 south of Horse Creek. There are several acres of terrain that Forest Service GIS layers map as having characteristics of landslide prone terrain. Field verification will drop out all the landslide prone acres and a PACFISH buffer placed around unstable slopes.

Temporary Road Construction: A little over a half mile of temporary road will be required to support harvest. The temporary road will be constructed in Unit 17 and will be adjacent to a portion of the RHCA for a first-order tributary to Horse Creek. The road will not cross live water and should not have any connection points to active channels; therefore should have no direct or indirect sedimentation into Horse Creek.

Upper American River Subwatershed

Proposed actions are limited within the Upper American River subwatershed and concentrated within the Forest Plan watersheds of the same name. The 24 acres of proposed harvest (a mix of Regeneration and Intermediate) and 8 acres of fuels treatment occur along Forest Roads #443 and #2116 at the drainage divides between watersheds. Given the location of the harvest, which is away from any potential connection to live water and the small scale of the proposed harvest, there will no direct or indirect impacts to water quality from proposed actions. No temporary roads will be built in the watershed.

Road Construction, Reconditioning/Maintenance, and Log Haul

Outside of temporary road construction, road activities that consist of reconstruction, intensive maintenance and road conditioning, and the increased traffic of log haul will have the greatest potential to deliver sediment into live water. The risk factors which increase the potential of roads to deliver sediment are surfacing, proximity to water at stream crossings and in riparian areas, and whether the road crosses landslide prone terrain. A table of roads and characteristics that may contribute to sedimentation such as stream crossings and surfacing is found in the supporting information document.

At the site-scale, sedimentation from individual road segments can be highly variable depending on the position of roads on hillslopes, proximity of road segments to live water, road template insloped with ditch or outsloped, road surfacing, and level of road traffic (Elliot 2013). Delivery of sediment to streams from roads requires a connected segment of the road to live water (Gucinski et al 2001; Wemple et al 1996). Road segments where erosion results in sedimentation into streams are typically connected to live water through ditches or erosion features as gullies or ruts (Elliot 2013). Sediment delivery into streams from surface erosion is dramatically decreased where road construction incorporates constructed drainage features like cross-drains and where vegetated buffers exist around streams (Elliot 2013, Opperman et al 2005). In addition to location of road, buffers, and road design, the road surface is important for controlling potential erosion. Graveling of road surfaces reduces sediment production (erosion) by reducing the surface area of soil exposed to raindrop impact, tire friction, and adverse effects of vehicular

weight (Megahan et al. 1991), though in some cases with more traffic the fines from gravel can become a sediment source themselves (Eliot 2013). In a study that compared erosion from both native surface and graveled road segments, native surfaces generated 7.5 times more sediment than graveled road segments (Brown et al. 2013).

In the project area most of the roads in the project area are graveled, but some of the key roads such as 9716, 9715, and 9714 the gravel is very poor and powdery condition and may not abate sediment. The major haul routes out of the project area along 356, 443, and 464 are very high standard roads with effective drainage structures in place and are located higher on the ridges and likely have only limited (seasonal) connectivity to perennial streams. Project BMPs and design features such as dust abatement, ensuring drainage features are functioning, and avoiding haul during very wet periods will prevent sedimentation from these high standard roads. However, most of interior haul routes that connect Units and landings with the higher standard haul routes listed above will require significant surface work to bring the roads to haul standards. In general, the highest risk for direct sedimentation into live water will be during road maintenance/reconstruction work including actions like cleaning and opening ditches and installing or improving drainage features such as culverts, water bars, or cross-drains. There will be sediment delivery likely during these work periods; however, the efficacy of BMPs and design features after roads are brought to standard should prevent chronic sedimentation. The Aquatics section details research related to BMP efficacy. The highest risk for chronic sedimentation following project work is Forest Road #9714, the steep fillslopes, particularly at the stream crossings have several small pre-existing slope failures and following project work the risk of slope failures at crossings will remain high. Road impacts from use and road reconstruction or road reconditioning are modeled in the NEZSED model and result are presented in the Cumulative Effects section. A comparison of road sedimentation rates between NEZSED and those predicted by WEPP:Road is provided in the supplemental information (document 28-004). The proposed road work where delivery is anticipated will not result in sedimentation to levels that exceed Forest Plan thresholds.

Cumulative Effects

Water Yield

Recent literature has converged upon a 20% change in forest canopy as commonly producing a detectable change in peak flows and/or average annual water yield (MacDonald and Stednick 2003; Grant et al. 2008, Troendle et al. 2010). The Matrix of Pathways and Indicators of Watershed Condition for Chinook, Steelhead, and Bull Trout is an analysis tool adopted by federal agencies to describe the condition and function of many watershed processes (NOAA 1998). ECA is one of several indicators used in the matrix. High quality habitat is associated with ECA of less than 15% in a HUC10 watershed and all internal HUC12 subwatersheds, moderate quality is associated with 15-20% ECA in HUC10 watersheds, with one or more internal HUC12 subwatersheds at 15-30% ECA, and low quality is associated with ECA of greater than 20% in a HUC10 watershed, with one or more internal HUC12 watersheds at greater than 30%. Using both recent literature and the 1998 NOAA Matrix, with the exception of the Glover Creek-Selway River subwatershed, all project watersheds are in good condition for existing and cumulative water yield (Table 9). Following project activities, the Glover-Selway watershed will be in the moderate ranges. Given the subwatershed vegetation recovery and attenuating water yield following the 2015 wildfires along with the retention of the riparian buffers, the addition 4% of project related increases in ECA throughout the larger subwatershed should have no impact on stream channel stability and the overall water balance and runoff timing within the watershed.

Table 9. Cumulative subwatershed ECA following project activities

HUC_12	HUC_12_NAME	Acres	Acres Forest Service	Existing Total ECA	Final ECA

170603020402	Glover Creek-Selway River	29019	29019	17.93	21.99
170603020306	Horse Creek	9618	9618	7.42	11.62
170603020404	Ohara Creek	37880	37880	5.85	7.58
170603050201	Upper American River	15259	15114	2.59	2.81

Water Quality

Cumulative effects arise from the incremental impact of an action when added to other past, present, and reasonably foreseeable actions. Based on the analysis presented in this report, the Green Horse project combine activities will incrementally add to existing sedimentation levels from recent past management actions of harvest, fuels treatment, wildfire, and roads. The NEZSED model was used to compare existing Forest Plan Prescription Watershed sediment yield with estimates of potential sedimentation increase as a result of the proposed activities. The NEZSED model incorporates past actions of harvest, wildfire, existing road system, and fuels treatment to determine existing condition of sediment yield compared to base levels for each watershed. The projects included in NEZSED include all harvest, wildfire, and prescribed burn projects within the last 15 years, ongoing projects, and future proposed projects where these projects occur in analyzed Prescription Watersheds. Past projects do include Hamby Saddle Roadside, Johnson Bar Salvage and Wildfire, Wash Salvage, and Wash wildfire. The past projects in Horse Creek were old enough that they no longer registered a sediment yield value in NEZSED, but the roads were analyzed in NEZSED. The ongoing project of Red Moose (Marek Salvage and Red Moose Timber Sales) is included in the existing condition output for NEZSED. There are two projects with large project areas, which are likely to be proposed the West Meadow Fuels prescribed fire project and Limber Elk vegetation management project. The potential West Meadows fuels project does not overlap with the Upper Main Horse Creek Forest Prescription watershed but will occur within the Horse Creek HUC 12 watershed. Additional sediment and erosion from burns will not overlap with incremental inputs of the proposed work in Green Horse, however, if canopy coverage is lost as a result of the prescribed fires there could be an overlapping effect with increased water yield. In general, prescribed fires are designed to remove understory and ladder fuels and should not be planned to alter canopy structure; consequently, there should be no increase in ECA that would alter channel or watershed function. However, as the Meadow Fuels prescriptions are finalized and burn locations identified changes in ECA in the West Meadow Fuels project analysis will be analyzed. The Limber Elk proposed harvest will likely overlap in for log haul in Upper American River. As only 18 acres of regeneration harvest is proposed within American River for the Green Horse project and there are no anticipated water quality impacts from Green Horse log haul in American River because of the high standard roads and implementation of BMPs; consequently, no anticipated cumulative effects to the Green Horse project are anticipated as a result of the Limber Elk proposed actions. All of the prescription watersheds will remain below the sediment yield guideline allowable under Forest Plan Appendix A. Results from NEZSED model output follow below in Table 10.

Table 10. NEZSED predicted sediment yield follow Green Horse proposed actions in 2020

Prescription Watershed	Typical Year	2020	2020	2020	Percent Over Typical Year Base Erosion Rate		Allowed
					2020	2020	Appendix A

	Average Annual Base Sediment Delivery (Tons/yr)	Estimated Current Sediment Delivery from Roads and Past Harvest Activities (Tons/yr)	Estimated Current Sediment Delivery from Wildfire (Tons/yr)	Estimated Sediment Delivery from Proposed Project Alt C (Tons/yr)	Percent (%) Over Base from Past Activities	Percent (%) Over Base from Proposed Project	Percent (%) Over Base threshold in Appendix A of Forest Plan
FALLS CREEK	306.3	7.4	0.0	28.4	2	12	50
ISLAND CREEK	143.3	3.3	0.0	5.2	2	6	70
UPPER AMERICAN RIVER	166.0	4.3	0.0	8.8	3	8	30
UPPER MAIN HORSE CREEK	128.7	5.5	0.0	12.1	4	14	70
SADDLE CREEK	153.1	1.7	0.0	9.9	1	8	30
WART CREEK	76.0	5.8	0.0	5.8	8	15	30
LOWER O'HARA CREEK*	447.9	9.4	0.0	10.1	2	4	30
HAMBY	170.3	20.8	0.0	0.0	12	12	30
EAST FORK O'HARA CREEK	115.4	0.6	0.0	0.0	1	1	30
WEST FORK O'HARA CREEK	92.0	2.2	0.0	0.0	0	2	30
O'Hara Creek True Watershed	857.2	25.4	130.0	0.0	0	18	30

Implementation of project design features, adherence to best management practices, and maintenance of PACFISH buffers would reduce potential erosion and further limit the risk of sediment reaching streams (document 11-004). Any sediment yield increases would be short-term (0-5 years) and beneficial uses in Selway River and the major tributaries impacted by project work O'Hara Creek, Saddle Creek, Island Creek, Falls Creek, Horse Creek, and American River.

Aquatic Species

Because RHCAs have and will continue to be retained on streams, a detailed discussion of habitat indicators such as large wood, pools and riparian shade are not discussed. No activities other than the existence or decommissioning of roads have occurred in the RHCAs since 1995, therefore no changes to wood, pools, or shade have occurred as a result of management activities. This analysis focuses only on sediment and how it relates to Forest Plan fish/water quality objectives.

Streams and Fish Species

There are 150 miles of streams within the Green Horse project area. Most are perennial, moderate to high gradient (5 to >12%) and fishless. There are about 5.3, 0.7, 0.9, 0.9, and 4.2 miles of fish bearing stream in O'Hara, Stillman, Island, Falls, and Upper Main Horse Creeks, respectively (Figure 5). O'Hara Creek provides designated critical habitat for ESA listed steelhead trout, feeding, migration and overwintering (FMO) habitat for listed bull trout and EFH (essential fish habitat) for spring Chinook/coho salmon (Figure 5). None of the other tributaries contain critical habitat for listed fish species.

Riparian areas

Riparian areas are mostly well vegetated and dominated by mixed conifer species as a result of fires that occurred in 1889 and the early 1900s. Stream temperatures and streambank stability are likely within

natural conditions in these areas due to the thick vegetative cover along most of their length. The lower two-thirds of Island, and lower half of the Falls Creek watersheds burned in the Wash Fire of 2015. Aerial photos of Island Creek show some tree mortality in riparian areas due to post-fire insect-related mortality. Results are likely similar in Falls Creek. Large wood levels are expected to increase in the future as these trees fall. Riparian areas in the upper third of both watersheds remain dominated by larger green trees.

Past Harvest and Recent Fire

Roughly 3,100 acres of project area watersheds were harvested between 1975 and 1994. Salvage harvest was conducted on about 500 of the acres and clear cuts conducted on the remainder. Under 200 acres have been harvested since 2003. The 2015 Wash Fire burned about 7,900 acres in the Island, Upper Main Horse, and Falls Creek watersheds.

Roads

There are 59 miles of road in the project area of which 43 miles are graveled and the remainder have a native (dirt) surface. The majority occur in the headwaters of the drainages where slopes are gentle, and the risk of stream crossing failures is very low (Figure 5). The result is low RHCA road densities which range between 0.1 and 0.7 mi/mi² for all four Forest Plan prescription watersheds in the project area. Densities are within the desired range of less than 1 mi/mi². Road decommissioning has occurred in the project area. A total of 2.2, 0.3, 3.5, 1.1, and 0.3 miles of road have been decommissioned in Island, Falls, Upper Main Horse, Wart and Saddle Creeks, respectively.

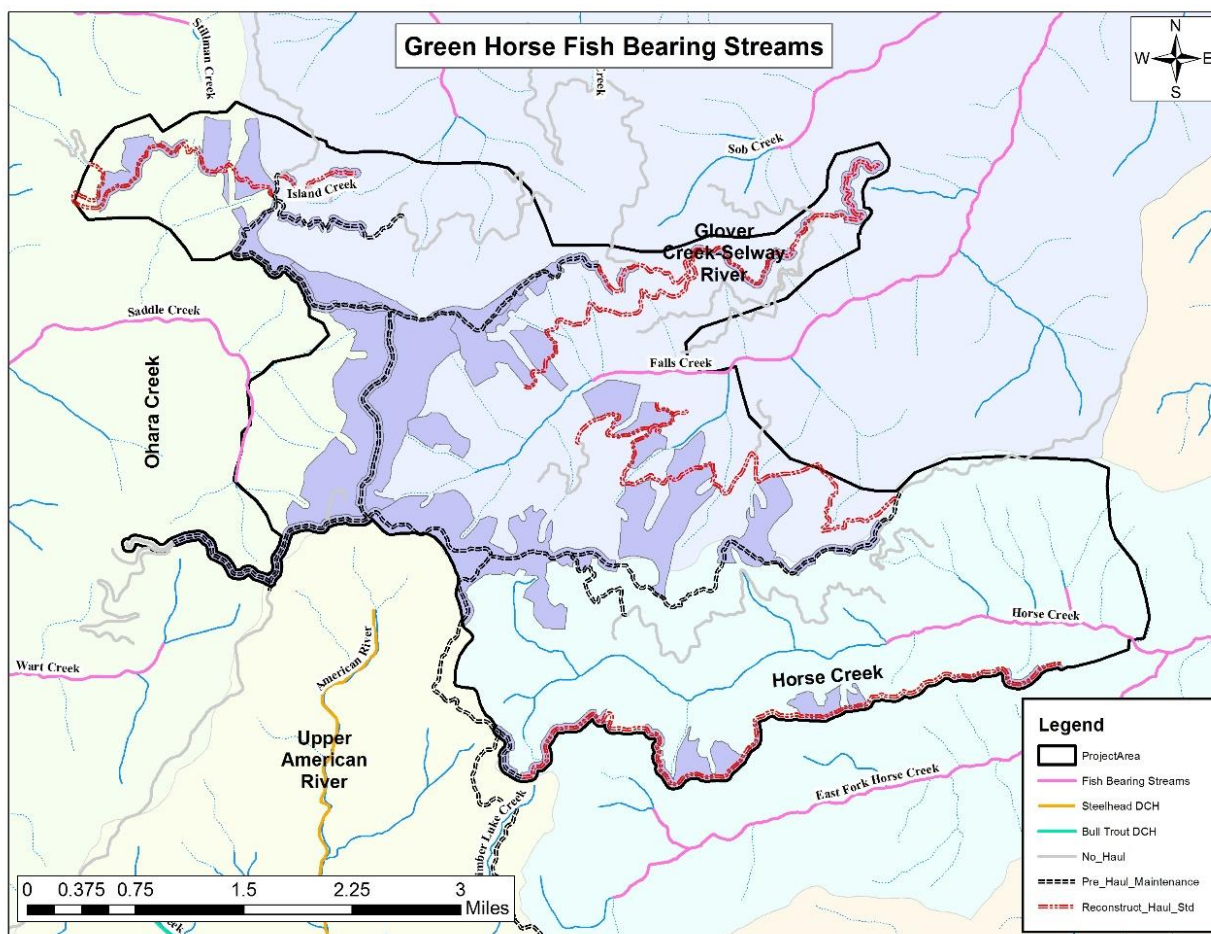


Figure 5. Map of fish bearing streams, ESA designated critical habitat, proposed units and proposed road work within the Green Horse project area.

Forest Plan Fish/Water Quality Objectives

The Nez Perce Forest Plan Appendix A contains fishery/water quality objectives for Forest Plan designated prescription watersheds. Cobble embeddedness data from a stream is compared to desired conditions as described by Espinosa (1992) to determine where a stream lies in relation to Forest Plan water quality objectives (Table 11). Where embeddedness data is not available, other information is used, such as legacy stream data, disturbance activities occurring within the last 20 years including management and wildfire, watershed restoration activities, and changes in management practices (Conroy and Thompson, 2011). Falls, Horse, and Saddle Creek watersheds are assumed to meet their objectives due to minimal management in the last 20 years and low sediment yield even after the Wash Fire of 2015 (Table 11). Recent substrate data indicates that Island Creek does not meet its objective and therefore requires an upward trend analysis (Appendix A).

Table 11. Forest Plan water quality objectives, cobble embeddedness and fishery habitat potential.

Forest Plan Prescription Watershed	Forest Plan Water Quality Objective	Fishery Habitat Potential (1987)	% Cobble Embeddedness (year)	Current Fishery Habitat Potential	Water Quality Objective Met?
Island	70%	100%	52% (2014)	55%*	No

Forest Plan Prescription Watershed	Forest Plan Water Quality Objective	Fishery Habitat Potential (1987)	% Cobble Embeddedness (year)	Current Fishery Habitat Potential	Water Quality Objective Met?
Falls	80%	100%	No data-inappropriate channel type for measurement	--	Assumed Yes based on existing sediment yield of 2%^ over base after 2015 Wash Fire and minimal management (200 acres of prescribed fire) since 1997. Forest Plan allowable sediment yield is 70%.
Horse	80%	90%	No data-inappropriate channel type for measurement	--	Assumed Yes based on existing sediment yield of 3%^ over base after 2015 Wash Fire and minimal (25 acres) of timber harvest since 1994. Forest Plan allowable sediment yield is 30%.
Saddle	90%	100%	No data	--	Assumed Yes based on no management activities since 2008. Last activity was 100 acres of prescribed fire in 2008. Prior to that was 100 acres of clear-cut in 1988. Less than 5% of the watershed has been managed.

^ - Data source is the Road, Administrative and Recreation Site Maintenance EA (2016)

FISHSED

The use of FISHSED is required by the Forest Plan in conjunction with the NEZSED model. Existing cobble embeddedness levels from survey data are input into the model, as well as the percent over base outputs from NEZSED. FISHSED then calculates a predicted increase in cobble embeddedness and the subsequent effects on summer and winter rearing habitat capability resulting from project activities. FISHSED is only useful for comparing action alternatives and does not represent actual increases in sediment or changes in habitat.

Table 12, Table 13, and Table 14 shows the FISHSED model outputs. Island Creek, Upper American River, and O'hara creek watersheds remain within the suggested change of 10% or less (Stowell et al, 1983) for predicted cobble embeddedness, summer carrying capacity, and winter carrying capacity. Only the true O'hara Creek Watershed was used for the FISHSED model due to not having cobble embeddedness data available for the individual prescription watersheds.

Falls Creek and Horse Creek are not modeled using FISHSED because the stream channel type is not appropriate for measuring cobble embeddedness. Both creeks are meeting the allowed percent over base threshold for sediment (modeled by NEZSED) as described in appendix A of the forest plan (Watershed section). It is assumed that both Falls Creek and Horse Creek will remain within the suggested change of 10% or less for predicted cobble embeddedness, summer carrying capacity and winter carrying capacity

based on the NEZSED results, BMP effectiveness, and implementation of PACFISH buffers (document 11-004).

Table 12. Existing cobble embeddedness compared to FISHSED predicted cobble.

Prescription Watershed	Existing CE %	Predicted CE %	Proposed Action % Change
Falls Creek	-	-	-
Island Creek	55.25	55.79	0.54%
Upper American River	27	27.72	0.72%
Upper Main Horse Creek	-	-	-
O'hara Creek True Watershed	17.36	18.98	1.62%

Table 13. FISHED predicted effects on summer rearing habitat. No Action is the existing condition

Prescription Watershed	Existing CE %	No Action	Proposed Action	Proposed Action % Change
Falls Creek	-	-	-	-
Island Creek	55.25	80	79	1%
Upper American River	27	95	95	0%
Upper Main Horse Creek	-	-	-	-
O'hara Creek True Watershed	17.36	98	98	0%

Table 14. FISHED predicted effects on winter carrying capacity. No Action is the existing condition

Prescription Watershed	Existing CE %	No Action	Proposed Action	Proposed Action % Change
Falls Creek	-	-	-	-
Island Creek	55.25	15	15	2
Upper American River	27	65	64	1
Upper Main Horse Creek	-	-	-	-
O'hara Creek True Watershed	17.36	55	52	5

Spatial and Temporal Boundaries

The spatial boundaries for analyzing the direct and indirect effects to project area streams are calculated at the Forest Plan prescription watershed level (Figure 4). The temporal bounds are 5 years which is the period of the modeled effects of the NEZSED/FISHSED models.

The spatial and temporal bounds for the cumulative effects are the same as for the direct and indirect effects. Any area larger than this would dilute the effects of project activities to the point where they would not be measurable.

No Action

The no action alternative would result in no timber harvest, prescribed fire, or construction of temporary roads, or road maintenance on approximately 20 miles of road. Cross drain culverts would not be installed on roads near creeks. The existing condition would be maintained, and existing roads may continue to contribute sediment to streams. The risk is considered low.

Proposed Action

Direct and Indirect Effects

No direct or indirect effects to fish or their habitat from timber harvest or temporary road construction related activities are expected due to RHCA retention, design features and BMP implementation. Temporary roads would be located with no stream crossings and would be decommissioned after use. Recent local monitoring of 13 temporary roads (USDA 2016a) and other field reviews showed no sediment delivery to streams from temporary roads.

As reported in the watershed section (water yield), project activities in the Glover Creek-Selway River Subwatershed would result in an ECA of 21.99% post project. This is classified as moderate habitat conditions as outlined in The Matrix of Pathways and Indicators of Watershed Condition for Chinook, Steelhead, and Bull Trout (NOAA 1998). There should be no direct or indirect effects to fish species or their habitat because the 4% increase in ECA “should have no impact on stream channel stability and the overall water balance and runoff timing within the watershed” (Watershed section).

No direct effects from prescribed fire is expected as no ignition would occur within RHCAs and burning would take several years to accomplish. The use of prescribed fire on the Forest has resulted in conditions that emulate natural fire with limited sediment delivery to streams. Low tree mortality from prescribed fire in riparian areas would occur.

No direct effects to streams would occur from cross-drain culvert installation activities since no stream channels would be disturbed. Cross-drain culverts would be installed an average of 50 to 200 feet away from stream channels where needed. There would be beneficial indirect effects as the activities would divert sediment away from streams.

The risk of direct or indirect road-related sediment delivery to streams is expected to be negligible from log hauling activities. There are an estimated 22 stream crossings associated with log haul routes, all of which occur on very small streams. All are well vegetated and able to capture and filter out road related sediment, especially when combined with the installation of cross drains. Arismendi et al (2017) found no significant increase in median suspended sediment or turbidity downstream compared to upstream of road crossings where road reconstruction and log haul occurred. Dust abatement would minimize the amount of road related sediment added to streams. Sanders and Addo (1993) showed that abatement produced half the amount or less of dust as untreated graveled roads. They also showed that traffic speeds affect the amount of dust produced. Slower traffic speeds (20 -30 mph) produce half as much dust as higher speeds (40+ mph). Log haul traffic speed is not expected to exceed 30 mph and would be closer to 20 mph due to the narrow, twisty road network in the project area. When combined with road improvement activities, log haul is not expected to add measurable amounts of sediment to project area streams.

Cumulative Effects

Direct and indirect effects from proposed activities are expected to be negligible; therefore, there would be no cumulative effects to sediment delivery from the proposed action. Subsequently, there would be no cumulative effects to fish or their habitat.

Economics

This analysis utilizes an estimate of volume harvested and the logging systems utilized, to develop a monetary value for each alternative. The estimated volume harvested alone also relates to economic effects on the analysis area.

Direct, Indirect, and Cumulative Effects of No Action and the Proposed Action

Economic analysis of this project in Table 15 shows the Proposed Action would be an economically feasible sale because it has a positive a net value. No Action would not generate any positive values nor have any costs associated with the NEPA decision, so its net value would be zero.

Table 15. Predicted stumpage and present value

Alternative	Volume (CCF)	Volume (MBF)	Appraised Total ^a	Reforestation ^b	Implementation ^c	Net Value
No Action	0	0	-	-	-	-
Proposed Action	42,200	23,200	\$2,441,000	1,343,622	\$188,000	\$909,378

^a Appraised value predicted high bid includes skid trail decom and road costs associated with the harvest.

^b Reforestation costs include site preparation burning and planting costs with overhead.

^c Implementation costs include presale, engineering and administration costs. NEPA costs are not included in this cost total.

Timber harvest operations have potential direct and indirect economic impacts as shown in Table 16. The Proposed Action would sustain forest product industry jobs, provide revenue to communities through wages and salaries, and revenue generated through sales of goods and services as shown in Table 17. In addition, the receipts from this project would contribute to the 25%-Fund, which Idaho County could choose to accept to provide funding for county roads and local school districts. Taking no action would not generate any revenue to communities either directly or indirectly, nor would it support any jobs or provide funding for county roads or local school districts.

Table 16. Economic results per million board feet of timber harvested

Forest product Industry Jobs Sustained ^a	22 jobs per 1.0 MMBF
Revenue to Communities Through Wages and Salaries ^b	\$667,000 per 1.0 MMBF
Revenue to Communities Through Sales of Goods and Services ²	\$3,850,000 per 1.0 MMBF

^a Source: University of Idaho, CNR, "Economic Contributions of Idaho's Forest Products Industry 2017."

^b Source: Cook, et al. "Idaho's Forest Products Industry Current Conditions and 2016 Forecast."

Table 17. Timber Harvest Jobs and Income for No Action and Proposed Action

Alternative	Volume (MMBF)	FTE Jobs Sustained	Revenue to Communities thru Wages (rounded)	Revenue thru Goods and Services (rounded)
No Action	0	0	0	0
Proposed Action	23.2	510	\$15,474,000	\$89,320,000

Idaho Roadless Areas

Within the Green Horse project area, there are two roadless areas designated by the Idaho Roadless Rule. The Green Horse project proposes prescribed burning (268 acres) and roadside hazard tree removal (intermediate harvest) along Forest Roads 464, 464-A, 356, and 2013 (approximately 3.7 miles and 70 acres) within the O'Hara-Falls Creek roadless area and roadside hazard tree removal (approximately 5.7 miles and 108 acres) and Forest Road 2116 within the West Meadow Creek. Total project activities are 1% of each roadless area (Table 18). These actions occur within the following Forest Plan management areas: 01 – Public Safety, 12 Timber Production, and 21 – Moose. All project activities are proposed in the Backcountry/Restoration theme of the O'Hara-Falls Creek and West Meadow Creek roadless areas under the following exception to the Idaho Roadless Rule: *Where incidental to the implementation of a management activity not otherwise prohibited by this subpart* (36 CFR Part 294.2(c)(1)(vii). The final Idaho Roadless Rule clarifies that when assessing whether actions maintain or improve roadless characteristics, responsible official's evaluations examine long term effects rather than only immediate consequences.

Table 18. Green Horse project roadless area roadside treatment miles and acres

Roadless Area	Theme	Road Number	Acres of Hazard Tree Removal	Miles of Hazard Tree Removal	Percent (%) of Roadless Area
O'Hara-Falls Creek	Backcountry/Restoration	464	19	1	<1
		464-A	18	0.8	

Roadless Area	Theme	Road Number	Acres of Hazard Tree Removal	Miles of Hazzard Tree Removal	Percent (%) of Roadless Area
		356	51	2.1	
		2103	19	0.8	
		2116	73	3.7	
West Meadow Creek	Backcountry/Restoration				<1
Total			180 acres	9.4 miles	<1%

No Action

Dead and dying trees within falling or striking distance of roads would continue to fall and block Forest system roads. Forest visitors and workers will continue to be exposed to hazardous conditions as trees fall, cause resource damage, and block safe ingress and egress to National Forest System Lands. This maintenance action would not occur and forest infrastructure would be at risk. Lack of maintenance could render infrastructure in less than safe conditions and may result in closure of roads and trails in the future. Lack of access may limit visitor's opportunities to access trailheads or remote sections of the O'Hara-Falls Creek and West Meadow Creek Idaho Roadless Areas.

Natural Integrity

Natural processes would continue (see No Action under the Forest Vegetation section). Where road access is blocked due to fallen trees, routine maintenance cannot occur, culverts may become plugged leading to catastrophic road failures which could have significant negative effects to the natural integrity of the area.

Undeveloped

Lack of maintenance could create a loss of undeveloped character due to an increase in unauthorized user created routes (developments), which often take the path of least resistance and around heavy concentrations fallen trees. No action or de facto abandonment of roads without proper surveys could again result in road failures that would need to be addressed in the future.

No action could ultimately lead to an increase in the evidence of timber cutting adjacent to the roads, either from firewood gatherers, the public maintaining access, or Forest personnel needing to maintain administrative access. Large numbers of dead trees across the road were sawed through, generally only wide enough to allow passage of a vehicle. The result was large numbers of sawn-off tree bole segments sticking into the road creating an unsightly and unsafe jack-strawed mess for miles. In that situation, the evidence of development is far greater than the proposed action which would cut and remove the trees from the site.

Outstanding opportunities for solitude or a primitive and unconfined type of recreation

Where roads become blocked by fallen trees; a lack of road maintenance would limit access to the existing opportunities for primitive and unconfined recreation.

Special Features or Values

There would be no effects to special features or values.

Manageability

No action would not affect the manageability of the O'Hara-Falls Creek and West Meadow Creek Roadless Areas as future wilderness areas.

Proposed Action

The proposed action to cut hazard trees is limited to 150 feet or less from existing Forest System Roads (2116, 464, 464-A, 356, and 2103) (Table 18), therefore the effects are generally going to be the same or similar across all of the Idaho Roadless Areas within this project's area. For this reason, this analysis will

combine the effects discussions, rather than repeating the same conclusions 14 times. The actual effects are expected to be similar to the 2012 hazard tree maintenance project (USDA 2016b) where cutting tended to be clumpy as discussed in more detail below.

Direct and Indirect Effects

Natural Integrity

The Natural Integrity would remain consistent with that described in the Idaho Roadless Rule decision in the long term. In the short term, the proposed action minimizes disturbance to within 150 feet or less of the road to provide for public safety; this modification is minimal when compared to the vast extent of the roadless areas that are not being modified. The road itself is an environmental modification on the landscape, this action may modify the natural environment surrounding the road slightly in the short term. In the long term the natural quality will return quickly once the roadsides treated by removing hazard trees are revegetated. The size of opening next to the road depends on the amount of hazard trees; the intent of the action is not to create large openings. The tree removal is so minimal and adjacent to an existing road that the action will have little to no effect on scenic integrity (visual quality objectives will be met, see scenic quality analysis (document 33-003) and the ROS as it is already a semi-primitive motorized or semi-primitive non-motorized environment along roads (See also Undeveloped Section below and documents 33-003 and 33-004 (scenic quality analysis)). Because of the limited area and scope of activities, along with project design criteria that includes retaining PACFISH buffers and avoiding field verified landslide prone areas effects are expected to be minimal.

The roadless areas would continue to provide habitat for sensitive and management indicator species wildlife and plant species including gray wolf, fisher, fringed myotis, long-eared and long-legged myotis, western toad, North American wolverine, neotropical migratory birds, American marten, northern goshawk, pileated woodpecker, Rocky Mountain elk, Shiras moose, Payson's milkvetch, green bug-on-a-stick, clustered lady's slipper, evergreen kittentail, and Idaho barren strawberry. See effects of intermediate harvest in the wildlife and botany section for each of these above species under the environmental impacts section.

Meadow Creek (and its tributaries) is valued for its Chinook summer salmon and steelhead trout habitat. Meadow Creek itself was not included in the effects analysis for aquatic species because it is greater than 1000 feet from the project area and haul routes and any area beyond this would dilute effects of project activities. No streams within the roadless areas would be affected (see Watershed and Aquatic Species sections under Environmental Impacts). Additionally, the Horse Creek Administrative Research Area is no longer used, and all data devices have been removed (document 32-006).

Implementation of the prescribed landscape burning in the O'Hara-Falls Creek roadless area would have a beneficial effect to the natural qualities of the area because disturbance would be sustained, although the mechanism of disturbance would be human caused and not natural. Where prescribed fire coincides with decadent shrubfields, they would be rejuvenated and become more available as browse for wintering wildlife. In timbered areas, the mixed-severity mosaic caused by prescribed burning would create patches of early successional forest that would ensure a balanced range of age classes distributed across the area.

Undeveloped

The undeveloped quality for the area would remain consistent with that described in the Idaho Roadless Rule decision as described in the Opportunities for Experience.

Activities would take place on existing Forest Roads that are on the Forest transportation atlas (part of the existing transportation system). There are no current or proposed plans to actively or passively decommission the road segments proposed for maintenance in this project. Roads generally do not occur inside roadless areas as a whole, but short segments intermittently cross the roadless area boundaries; or where they form the roadless area boundary.

Proposed timber cutting would create stumps and, depending on the number of trees cut, openings may occur adjacent to existing roads where hazard trees are to be removed. The size of opening next to the road depends on the amount of hazard trees; the intent of the action is not to create large openings; but to remove hazard trees. Activities would be confined to 150 feet or less from the road depending on hazard tree locations.

Stumps would be visible until they decayed, but generally only noticeable if a person were to be walking within areas where hazard trees were removed. It is unlikely that the casual observer or visitor driving through the area would notice either the stumps or openings for very long since the vegetative screening and regrowth of shrubs and trees would obscure the stumps within several years.

Monitoring and follow up site visits of the 2012 hazard tree removal project and the Road, Administrative, and Recreation Site Maintenance project of 2016-2017 has shown that the hazard tree removal areas generally do not resemble commercial timber harvest units since the intermittent and “clumpy” nature of harvested areas is less uniform than if commercial timber harvest activities were proposed (document 32-002). Hazard tree designation for the Green Horse project along roads in roadless areas would be selective (only dead and dying trees); and would either be through written description or by marking “cut trees” (as opposed to leave tree) so residual paint would not be noticeable, further reducing the evidence of timber cutting adjacent to roads. The expected tree removal would be less than the 2016 roadside treatment review monitoring.

Although there would be immediate, short term effects to the undeveloped nature of the two roadless areas, their very limited size and scope would not be significant. Additionally, the removal of hazard trees would not be substantially noticeable once brush and trees regrow in cut areas within one to two years for the shrub understory and 10 to 15 years for trees to get established and above the brush.

Implementing the landscape prescribed burning would cause little effect to the undeveloped characteristics of the O’Hara-Falls Creek roadless area. Low- to mixed-severity prescribed fire closely emulates the effects of wildfire under a wide range of climate and environmental conditions. Visitors would not likely be able to distinguish whether the fire was human caused or natural. A site-specific burn plan would be developed for the project and would document the desired effects and the environmental variables necessary for implementing the prescribed fire to meet objectives.

Outstanding opportunities for solitude or a primitive and unconfined type of recreation

Solitude

The Opportunities for Experience for the O’Hara-Falls Creek and West Meadow Creek roadless areas would remain consistent with that described in the Idaho Roadless Rule decision.

Effects to opportunities for solitude or a primitive and unconfined type of recreation are described here in the context of access to these opportunities since it is extremely unlikely that a visitor would seek or find any of these opportunities within 150 feet or less from an existing Forest road.

The road segments proposed for maintenance and timber cutting do, however, provide access to the O’Hara-Falls Creek and West Meadow Creek roadless areas where these opportunities can be found.

There would be a short-term displacement of visitors during implementation of the project, since roads would likely be closed temporarily to allow for safe falling and removal of hazard trees. Duration of closures would likely be short and confined to relatively small areas.

In the long-term (after harvest activities are complete), opportunities for unconfined and primitive recreation experiences would remain stable and improve over conditions that could result if hazard trees were not removed. Removing hazard trees that have the potential to block road access maintains access to these experiences in the O’Hara-Falls Creek and West Meadow Creek roadless areas. Due to the minimal

activity a short-term effect to semi primitive non-motorized and semi-primitive motorized ROS areas would occur only during felling and/or removal activities (5 years or less for each roadless area).

Opportunities for solitude and primitive unconfined recreation would be temporarily affected during implementation of the prescribed fire. Forest Roads 356 and 464 may be temporarily closed to allow for safe implementation of the burn. During ignition, sights and sounds of fire personnel would likely be heard throughout the roadless area, although these disturbances would be expected to last only a short time. Fire crews implementing the ignition operations would have less effect on solitude and unconfined recreation, since their activities would be confined to a small area immediately adjacent to Forest Service roads along the southern and eastern boundaries of the O'Hara-Falls Creek roadless area.

After implementation, the opportunities for solitude would remain unchanged from their current state. In the long term, this action does not affect these experiences should the area be designated as wilderness.

Opportunities for Primitive Recreation

The Opportunities for Experience for each roadless area would remain consistent with that described in the Idaho Roadless Rule decision in the long term. The proposed action does not add or decommission developments within the roadless area (See also Unconfined Recreation and Solitude (above). After implementation, the opportunities for primitive unconfined recreation would remain unchanged from their current state.

Special Features or Values

All of the special features listed in the Idaho Roadless Rule FEIS Appendix C for each area were reviewed against the proposed action. The O'Hara Research Natural Area is within the O'Hara-Fall Creek roadless areas and the Selway River is designated as a Wild and Scenic River within the West Meadow roadless area; neither of these special features would be affected by the proposed action. First-hand knowledge of the roadless areas and discussions with interdisciplinary team members and Forest Staff; as well as public comment determined there are no special features or values that would be affected within 150 feet of an existing road or within the units proposed for landscape prescribed burning, so there are no effects to special features or values (including the fisheries value for Meadow Creek, see Natural Integrity above).

Manageability

Cutting hazard trees from 150 feet or less next to existing forest roads would not significantly alter or impact the manageability of the any of these roadless areas since only a fraction of a percent of any individual area would be affected by the proposed activity. The roads proposed for hazard tree removal form partial boundaries for the roadless areas and would not affect the manageability of the roadless area at these boundaries.

There would be no changes to the size, shape, or access to the area and future wilderness designations would likely still utilize the road since, as described above, evidence of timber cutting would be substantially unnoticeable and would not change the age class/canopy structure of the area (FSH 1909.12 Chapter 70, Section 72.1).

The manageability of the O'Hara-Falls Creek roadless area would not be affected by the prescribed landscape burning. The current or future location of the Roadless Area boundary would not be affected by this activity.

Cumulative Effects

The cumulative effects boundary for this analysis is the individual O'Hara-Falls Creek and West Meadow Creek roadless area boundaries that would be affected by the proposed action.

The timeframe for the cumulative effects analysis is difficult to measure, considering the proposed action is for maintenance of an existing road within or adjacent to each of the roadless areas. There are no current plans to remove any of the roads (regardless of maintenance level) from the system and the effects of ongoing road maintenance to the roadless areas, including cumulative effects were analyzed and disclosed in Chapter 3 of the Idaho Roadless Rule FEIS (USDA 2008).

Routine maintenance of transportation systems of roads that fall within the roadless area boundary are expected to occur within both roadless areas for access to regeneration harvest units (that are outside of roadless areas) and commensurate with funding levels may apply where roads proposed for hazard tree removal extent beyond timber harvest units. Existing access designations would not change as a result of this project.

To the extent that the proposed action could be considered an additional incursion, entry, or site-specific action causing localized specific effects is documented in the effects sections above. Cumulatively, the proposed activities would not cause significant effects to any of the roadless area characteristics or preclude wilderness designations in the future because they occur within 150 feet or less from existing roads. It is further unlikely that the proposed action would lead to the need for future boundary adjustments, either as a roadless area or as a result of future wilderness designation because the boundaries of these roadless in context of the Green Horse project are Forest Roads. The limited effects that would occur (such as road closures or visible evidence of timber cutting/removal) would be short in duration as documented above. It is conceivable that the proposed action would cumulatively improve some roadless characteristics by facilitating opportunities for solitude and unconfined recreation by maintaining access to remote areas of the O'Hara-Falls Creek and West Meadow Creek roadless areas.

Other projects were considered in developing the scope of the cumulative effects analysis, however they were not analyzed in detail because cumulatively since they did not have any significant direct or indirect bearing on the effects to any of the roadless area contained in this proposal nor would they cumulatively change the wilderness capability of the O'Hara-Falls Creek and West Meadow Creek roadless area. As documented above and corresponding resource analysis; the proposed hazard tree removal (intermediate harvest) will have minimal effects. Additional projects that were considered were:

- Nez Perce (DRAMVU) – The Green Horse Project does not decommission, designate, override or otherwise change any access prescriptions of roads or trails. The Nez Perce DRAMU is currently in progress and if any road designations change, there would be no effect to the O'Hara-Falls Creek and West Meadow Creek roadless areas.
- Additional future roadside maintenance – it is conceivable that insect and disease outbreaks and/or large scale or multiple fires in the future would create additional need for the same roadside maintenance as proposed in the Green Horse project or other projects like the Road, Administrative, and Recreation Site Maintenance project. It would be difficult to speculate on the future effects to the roadless areas since there is no way to know when large fires could occur. Regardless, the scope and sale of the roadside hazard tree removal of the Green Horse project is small in context and intensity, and the results predictable and effects would be demonstrably minimal. For that reason, there is no foreseen cumulative impacts that would diminish wilderness capability or attributes of the O'Hara-Falls Creek and West Meadow Creek roadless area within this proposal.
- Other projects within the O'Hara-Falls Creek and West Meadow Creek roadless areas –There are no other past, present, or reasonably foreseeable projects that would result in cumulative effects that would lead to diminishment of the attributes or wilderness capability of any of the roadless areas within this proposal. There are other ongoing or future foreseeable actions within the roadless areas, however their scope and effects are dissimilar enough to not warrant inclusion in this analysis. Examples could include fire suppression, prescribed burning, and trail maintenance. The prescribed fire proposed within the West Meadow Creek roadless area would sustain disturbance in a disturbance-dependent landscape, resulting in a beneficial cumulative effect to

the natural qualities of the area. Because the implementation of the proposed action and future prescribed burning will have no effect, limited temporary effects, or beneficial effects to the wilderness characteristics of the area, the project will not alter area's potential to be considered for future wilderness designation.

Since inception of the Idaho Roadless Rule, all projects proposed in roadless areas are reviewed periodically by the Idaho Governor's Roadless Commission for consistency to the rule and to ensure due diligence to the Final Idaho Rule is maintained. The Green Horse project was presented at the October 2020 Idaho Roadless Commission meeting and the members agreed the project was in conformance with the rule and asked that it come back for a status update for the spring 2021 meeting.

The O'Hara-Falls Creek and West Meadow Creek roadless areas affected by the proposed action are part of a larger landscape proposed for wilderness designation under the Northern Rockies Ecosystem Protection Act (NREPA), H.R. 996, which has been introduced to the House in the 114th session of Congress. NREPA has been introduced into numerous previous sessions of Congress, but never enacted. As described above, the project would not affect the wilderness capability of any of the IRAs within the project area and would not lead to the need for boundary modifications in the future if NREPA or other wilderness designations were to occur.

Future activities could have slightly higher potential effects on the undeveloped and natural qualities of roadless areas in this theme; however, because the acreage is expected to be very limited, such activities should not affect natural ecosystem forces or opportunities for primitive and unconfined recreation.

Tribal Rights and Trust Responsibilities

Trust responsibility arises from the United States' unique legal relationship with Indian tribes. It derives from the Federal Government's consistent promise, in the treaties that it signed, to protect the safety and well-being of the Indian tribes and tribal members.

The Forest Service best serves the Federal Government's trust responsibility by:

- Ensuring Forest Service actions never diminish the rights of Indian tribes and tribal members;
- Ensuring Forest Service program benefits reach Indian tribes and tribal communities;
- Observing and enforcing all laws enacted for the protection of tribal cultural interests;
- Observing the principles of consultation whenever our policies, decisions, or other actions have tribal implications; and
- Treating NFS resources as trust resources where tribal legal rights exist.

The Green Horse project area is located within ceded lands of the Nez Perce Tribe. These ceded lands are federal lands within the historic aboriginal territory of the Nez Perce Tribe which have been ceded to the United States. In Article 3 of the Nez Perce Treaty of 1855, the United States of America and the Nez Perce Tribe mutually agreed that the Nez Perce retain the following rights:

"...taking fish at all usual and accustomed places in common with citizens of the Territory [of Idaho]; and of creating temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing horses and cattle..."

The Nez Perce-Clearwater National Forests is committed to fulfilling the Forest Service's trust responsibilities to Native Americans, to honoring rights reserved in the Nez Perce Treaty of 1855, and to strengthening the Forests' government-to-government relationship with the Nez Perce Tribe. The Forest Service manages and provides access to ecosystems that support Tribal traditional practices. The Green Horse project is expected to maintain and enhance these opportunities over the long term by improving roads and enhancing big game wildlife habitat.

The Nez Perce Tribe staff and Forest staff have discussed the Green Horse project at various quarterly meetings beginning in 2019. The Green Horse project was first introduced at a quarterly meeting April

24, 2019. Updates were given at the July 24, 2019, October 31, 2019, and January 15, 2020 quarterly meetings. A staff-to-staff meeting was also held on October 23, 2021. Throughout the planning process, Tribal staff have shared information on existing road conditions and expressed concerns about temporary roads, invasive species, road decommissioning, road improvements, landslide prone areas, treatments within roadless areas, information supporting the purpose and need and the proposed action, large openings, Pacific yew, elk vulnerability, and effects to migratory bird species.

Regulatory Framework

The management of resources on National Forest System lands within the Green Horse project area is based on several federal laws and regulations including the following list and described below for regulatory consistency.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) (42 USC 4321 et seq.) was signed into law on January 1, 1970. NEPA establishes national environmental policy and goals for the protection, maintenance, and enhancement of the environment and provides a process for implementing these goals within the federal agencies. The National Forest Management Act (NFMA) requires that projects and activities be consistent with the governing Forest Plan (16 USC 1604(i)). Title I of NEPA contains a Declaration of National Environmental Policy that requires the federal government to use all practicable means to create and maintain conditions under which man and nature can exist in productive harmony. NEPA section 102 requires federal agencies to incorporate environmental considerations in their planning and decision-making through a systematic interdisciplinary approach. The project design will adhere to the Nez Perce Forest Plan, including all applicable standards and guidelines.

Watershed and Fisheries Regulatory Framework

All Federal and State laws and regulations applicable to water quality would be applied to the Green Horse project, including 36 CFR 219.20, the Clean Water Act (1972), and Idaho State Water Quality Standards, Idaho Stream Channel Protection Act, and BMPs (document 11-004). In addition, laws and regulations require the maintenance of viable populations of aquatic species including the National Forest Management Act (36 CFR 219.19), subsequent Forest Service direction (Fish and Wildlife Policy 9500-4) and Forest Service Manual direction (FSM 2470, 2600).

Idaho Forest Practices Act

The proposed action is consistent with the Idaho Forest Practices Act (1974), including requirements to ensure reforestation, reduce impacts to soils, and maintain water quality.

Endangered Species Act

FSM 2670 directs the Forest Service to conserve threatened and endangered species and to use its authorities in furtherance of the Endangered Species Act (ESA) of 1973, and to avoid actions that may cause a species to become threatened or endangered. FSM 2670 also requires the Forest Service to maintain viable populations of all native and desirable non-native wildlife, fish, and plant species in habitats distributed throughout their geographic range on NFS lands. As directed by the ESA, biological assessments and consultation under section 7 of the ESA would be completed for this project if effects to listed species are expected.

Aquatic Species

Listed steelhead trout occur in several streams that flow through the project area but are not known to inhabit the reaches that occur in or directly downstream of the project area. There are 5 miles of designated critical habitat for steelhead trout, FMO habitat for bull trout, and EFH for salmon, all of which occurs in O'Hara Creek. There is no critical habitat in other project area streams.

The retention of RHCAs adjacent to timber harvest and prescribed fire units has been shown to protect both the fish and their designated critical habitat. Road improvement is designed to reduce sediment delivery to streams which would be beneficial to listed species and critical habitat.

No direct or indirect sediment effects to listed fish or their habitat is expected from temporary road construction or road reconstruction work as there are none within at least 0.7 miles of these activities. RHCA retention is expected to prevent measurable sediment effects to fish or critical habitat as previously discussed (USDA 2016a). The project determination for steelhead trout, bull trout, and their critical habitat, as well as EFH, is therefore “no effect”.

Steelhead Biological Opinion Consistency

A Biological Opinion on the Land and Resource Management Plans for National Forests and Bureau of Land Management units for Steelhead and Salmon in the Upper Columbia River Basin was written in 1998 (NOAA Fisheries). As a result, the Nez Perce National Forest designated O’Hara Creek as a priority watershed for ESA listed steelhead trout. Meadow Creek, which lies downstream from a portion of the project area, also contains area of high potential steelhead habitat. What follows are the guidelines that came from this biological opinion document and how the Green Horse Project meets the intent:

- Watershed analysis must be conducted prior to harvest, salvage, or thinning activities in riparian habitat conservation areas (RHCAs) and demonstrate the action would not retard/prevent attainment of RMOs or adversely affect listed fish.
The Selway-Middle Fork Clearwater River Subbasin Assessment was completed in 2001. The project conducts no activities other than road improvements within the RHCAs. This would be beneficial to streams over the long term.
- The Biological Opinion added a sediment RMO that was incorporated by reference from the 1995 LMRP Biological Opinion for chinook salmon. This RMO includes standards of less than 20 percent surface fines in spawning habitat or less than 30 percent cobble embeddedness in rearing habitat.
The existing cobble embeddedness for O’Hara Creek was 17% in 2019 and meets the sediment requirement. No sediment data is available for Meadow Creek however sediment levels are considered to be within natural ranges as little management has occurred within the watershed. Timber harvest has occurred on 0.9% of the watershed with most occurring more than 20 years ago. The project is not expected to add sediment to O’Hara Creek, Meadow Creek, or other project area streams since no live water culvert replacements are proposed. Cross drain culvert additions would not deliver sediment to streams but would be beneficial in the long term as a result of diverting road-related sediment away from streams.

Management considerations were also presented in the Biological Opinion. Considerations relevant to timber and road management include the following:

- Develop a schedule and prioritize to close, obliterate, and revegetate, or resurface as many existing roads as possible. Existing roads in RHCAs should receive high priority for treatment.
No roads are proposed for obliteration within the project area; however densities are 0.1 to 0.7 mi/mi² which meets the desired condition of less than 1 mi/mi² as determined by the Level 1 Matrix of Pathways and Indicators. A total of 0.7 miles of roads in RHCAs are already surfaced with gravel and will remain as such after the sale is complete. A total 0.3 miles are natives surfaced. All RHCA roads are currently closed to use and will remain so after harvest is complete.
- Define and avoid activities in landslide prone areas-
All landslide prone areas would be field verified and buffered according to PACFISH guidelines.
- Only use timber harvest methods that result in low levels of ground disturbance or that avoid

adverse effects to steelhead habitat.

Timber harvest would not adversely affect steelhead or their habitat due to the retention of PACFISH buffers in combination with tree and downed wood retention within the harvest units. Local monitoring (USDA 2016a) has shown that the buffers prevent sediment delivery to streams from harvest activities.

- Use only existing open roads, without construction of new landings.
The use of temporary roads and creation of new landings would not affect steelhead habitat due to their location near ridgetops and lack of mechanisms for delivering sediment to streams. Local monitoring (USDA 2016a) has shown no sediment delivery to streams from roads placed in these near ridgetop locations.
- Do not harvest in RHCAs.
No harvest is proposed within RHCAs.

Migratory Bird Treaty Act and Executive Order 13186

The project is meeting the intent of migratory bird conservation by retaining special habitats (riparian and old growth areas), as well as managing for a mixture of open and closed habitats. The forest is charged with maintaining viable populations of wildlife, and forest habitats continue to host annual migrations of neotropical avian species. Project design features would benefit migratory birds by potential limiting prescribed fire to a period outside of the nesting season, and retention of trees with nests or cavities would provide potential habitat for migrating species like the flammulated owl.

Clean Air Act, as amended

The Green Horse Project would adhere to the Clean Air Act (1963) and all post activity fuel reduction treatments would adhere to the requirements of the Montana/North Idaho Smoke management guidelines with project design features.

National Historic Preservation Act of 1966, as amended

The cultural resource surveys have been completed for the Green Horse project area and the report was submitted to the Idaho State Historic Preservation Office (SHPO). Concurrence from the Idaho SHPO was received on December 15, 2020.

Environmental Justice Act

The Green Horse analysis did not reveal any disproportionately high and adverse impacts to minority populations and low-income populations. Idaho and Clearwater Counties along with the Nez Perce Indian Reservation have been experiencing declining jobs associated with timber harvest (Idaho Dept. of Labor 2018). Based on the jobs sustained and the direct and indirect revenue, this project will contribute positively to the rural economy thus it will have a positive impact at the local scale which would include minority and low-income populations.

Idaho Roadless Rule

The cutting, sale, or removal of timber is permissible in Idaho Roadless Areas designated as Backcountry Restoration: vii) *Where incidental to the implementation of a management activity not otherwise prohibited by this subpart* (36 CFR Part 294.2(c)(1)(vii)). Removal of trees adjacent to forest roads within Idaho Roadless areas for public health and safety reasons is allowed. Specifically, this project proposes to remove trees adjacent to the roads within the roadless areas that are a hazard to the road described under the proposed action. The Green Horse project was presented to the Idaho Roadless Commission on October 27, 2020 with the consensus that the project conforms to the Idaho Roadless Rule.

While there may be some short duration effects, they are generally limited to the actual time frame that the implementation activities are occurring rather than the results of the activity. The hazard tree removal treatment areas are small in size and in scope as only dead and dying trees within 150 feet of existing

roads would be removed. Opportunities for semi-primitive recreation opportunities would be improved long term as a result of road improvement and hazard tree removal. Landscape burning would maintain most roadless characteristics; habitat for some species requiring large landscapes would be improved for the long term (document 32-011). The final Idaho Roadless Rule clarifies that when assessing whether actions maintain or improve roadless characteristics, responsible official's evaluations examine long term effects rather than only immediate consequences. By allowing the use of existing and permissible roads to support limited timber cutting activities, the ability to accomplish limited forest health objectives can be met without diminishing roadless characteristics over the long-term.

National Forest Management Act, as amended

The National Forest Management Act (NFMA) (16 USC 1600–1614, August 1974, as amended 1976, 1978, 1980, 1981, 1983, 1985, and 1990) reorganized, expanded, and otherwise amended the Forest and Rangeland Renewable Resources Planning Act of 1974, which called for the management of renewable resources on NFS lands. The NFMA requires the Secretary of Agriculture to assess forest lands; develop a management program based on multiple-use, sustained-yield principles; and implement a resource management plan for each unit of the NFS. It is the primary statute governing the administration of national forests. Project activities have been designed to be consistent with the NFMA (document 11-004).

Openings over 40 acres

Direction in Forest Service Manual 2470, Region 1 Supplement #R1 2400-2016-1, Section 2471.1 states that the size of openings created by even-aged silvicultural treatments in the Northern Rockies will normally be 40 acres or less, with certain exceptions. The request to exceed 40-acre openings documentation is available in the project record (document 17-018).

Nez Perce National Forest Land and Resource Management Plan

The Nez Perce Forest Plan (USDA 1987) includes goals, objectives, standards, and guidelines that direct management of forest resources. Forest-wide direction is applicable throughout the Forest, and management area direction ties specific goals, objectives, and standards to the unique capabilities of given parcels of land. Forest Plan management areas within the project area are listed in Table 1 of the proposed action was published for the combined scoping/30-day project (document 04-014). The Forest Plan standards apply to National Forest System (NFS) lands within the Nez Perce National Forest boundary. They are intended to supplement, not replace, National and Regional policies, standards, and guidelines found in Forest Service Manuals (FSM) and Handbooks.

The proposed project was guided by the goals, objectives, standards, guidelines, and management area direction within the Nez Perce National Forest Plan. This project would help move the Forest toward desired conditions as described in the Forest Plan. The Green Horse project is expected to meet all relevant Forest Plan standards (documents 11-004 and 11-008).

Forest Vegetation and Wildlife Habitat

The Green Horse project would be in compliance with the requirement in NFMA that regeneration harvest areas will be adequately restocked within five years after harvest. Past reforestation practices in the project area have proven to be successful on a wide variety of sites using a variety of silvicultural systems. This past regeneration success provides a good assurance of successful restocking within five years for this project. All harvest and planting treatments are followed up with reforestation stocking surveys after treatment, to ensure adequate restocking is achieved.

In areas identified as being within the grand fir mosaic, regeneration may require two years of gopher baiting and units may be planted at higher densities (360 trees per acre) to ensure successful regeneration (Ferguson & Byrne, 2000; Ferguson et al., 2005).

When timber is to be harvested using an even-aged management system, a determination that the system is appropriate to meet the objectives and requirements of the Forest Plan must be made, and, where clearcutting is used, it must be determined to be the optimum method. All even-aged management proposed in the Green Horse project is appropriate to meet the objectives and requirements of the Forest Plan. Silvicultural prescriptions will be written during implementation, prior to any vegetation manipulation and will address site-specific needs in the stand.

Approximately four of the six Management Areas (MAs) within the project area contain a primary or secondary timber objective. Potential harvest units are 91% within the suitable timber base with the remaining 9% being treated for public safety and hazardous fuels reduction. Primary objectives include managing for timber on a sustained-yield basis, optimizing growth and producing cost-effective wood products while still protecting soil and water resources. Secondary objectives include using timber harvest to improve big game winter range, managing for timber while protecting visuals and managing grand fir-Pacific yew plant communities to provide for continuing presence of Pacific yew.

Harvest within MA 1 is limited to roadside harvest to reduce fuel loadings and to reduce hazardous trees along the roadside for public and firefighter safety. The treatment in MA 21 is limited to slopes less than 35%, and silvicultural prescriptions will comply with MA 21 timber standards.

Old Growth

Currently, the project meets Forest Plan requirements for 5% old growth and 5% replacement in each prescription watershed within the project area. Areas that do not have 5% old growth have greater than 5% replacement old growth so that total forested prescription watershed acreage being managed for old growth is 10% or greater. Areas that are burned and cannot meet the 10% have adjacent watersheds with total old growth and replacement old growth greater than 10% (Table 19). Harvest in OGAA 03020113 is restricted to roadside harvest for firefighter and public safety. For OGAA 03020116, the adjacent watershed (03020117) has 22% Forest Plan OG. See below for more in-depth information on old growth and how it was analyzed for this project.

Table 19. Total percent of OGAA being counted towards Forest Plan old growth, by type. This does not include burned or open ground within Management Area (MA) 20.

OGAA	Appendix N		MA 20		**Total FP OG
	Existing OG	Replacement	*Burned	Unburned	
OGAA03020121	0%	24%	10%		24%
OGAA03020112	0%	16%	3%	1%	18%
OGAA03020229	6%	4%			10%
OGAA03020113	0%	4%			4%
OGAA03020116	0.5%	5%			6%
OGAA03020117	0%	15%	15%	7%	22%

* burned includes burned and open ground and was excluded from total FP OG

**Total old growth that meets Forest Plan OG requirements. Numbers are rounded to nearest whole number.

Appendix N

Criteria for stands selected for old growth management include: fall within estimated tree size classes of 20 inches DBH or greater, have at least 0.5 snags per acre, preferably over 21" DBH where possible, logs on the ground, 1-2 canopy layers, total canopy closure of 70% and signs of rot and decadence. While not all stands meet all criteria, stands for this project were selected based on a) their likelihood of meeting all or most criteria presently, or at some future date (for replacement stands) and b) the number of criteria they currently meet.

Green et al. 2007

In Region 1, Old-growth Forest Types of the Northern Region (Green et al. 2007) is used as the best-available science for old growth in the region. For this project, all applicable stand exam data from the project area was analyzed using Green et al (2007). The summary can be found in the project record. Under the Green et al. (2007) definition of old growth, there is one OGAA that contains 6% old growth, and one that contains 0.5% (Table 20). Future old growth is estimated to be within 10-40 years of being old growth.

Table 20. Acres within each OGAA within the project area that meet Green et al. (2007) definitions of old growth.

OGAA	Green et al. (2007)		Total
	Existing OG	Future OG	
OGAA03020121	0%	0%	0%
OGAA03020112	0%	1%	1%
OGAA03020229	6%	4%	10%
OGAA03020113	0%	0%	0%
OGAA03020116	0.5%	0.3%	1%
OGAA03020117	0%	0%	0%

No harvest units are proposed in stands being managed for old growth, nor stands being managed for future old growth. See project record for old growth summary data.

Management Area 20

This project does not propose any harvest in MA 20. Due to recent fires, some MA 20 has been burned over. When calculating total acres of existing old growth and old growth replacement, these burned stands were not used (Table 19). They do, however, contribute towards total acres being managed as old growth stands and will continue to be managed for old growth in the long term (Table 21).

Table 21. Total percentage of each OGAA within the project area that contains MA 20. This includes acres in MA 20 that have burned in recent fires, but still have long-term management goals for being managed as old growth.

OGAA	MA 20
OGAA03020121	10%
OGAA03020112	3%
OGAA03020117	15%

Big Game

The proposed action would increase openings within the Falls, Horse, Island, and Saddle elk analysis areas (EAAs) by three to 13%. The Green Horse Project is meeting the guidelines of Servheen et al. (1997) of at 50% elk habitat effectiveness (EHE) for three of the EAAs; the Island EAA is below the desired 75% EHE in the existing condition and the proposed action would not reduce the EHE level.

Harvest in Management Area (MA) 21 (moose) will only occur on “suitable” ground for timber management (slopes less than 35%) (document 11-004). No Pacific yew-dominated stands are being proposed for harvest. A minimum of 50% of the live Pacific yew component of a stand will be left scattered in the unit in leave clumps ¼ to ½ acre in size. Silviculture systems used will be site-specific, and will take into consideration preferred system. Retention will include leave strips between yew stands. Silviculture prescriptions will be designed to address desired reforestation conditions through species composition and stocking levels, taking site-specific information into consideration. Planned ignitions in MA 21 will only occur on “suitable” ground for timber management (slopes less than 35%). Silviculture

prescriptions will be designed and utilized in Prescribe Fire Burn Plan. Standards for slashing and piling within Pacific yew will be followed.

Soils

The Green Horse project meets Forest Plan standards related to soil resources. Potentials for soil displacement, compaction, puddling, mass wasting, and surface soil erosion have been evaluated through spatial analysis and targeted detrimental soil disturbance (DSD) field surveys. The proposed activities are not expected to elevate DSD above the 20 percent standard following the completion of all project activities. Implementation of the design features (specifically, reuse and subsequent scarification of legacy skid trails), is expected to keep the cumulative DSD below 20% (document 11-004). Implementation of project design features and BMPs would also serve to minimize erosion in the specified areas.

Watershed and Fisheries

The Green Horse project will allow for improvement in fish/water quality objectives through RHCA retention and cross drain culvert installations on roads. Both actions will minimize sediment delivery to fish habitat. NEZSED and FISHSED were used (see Watershed and Aquatic Species Sections as well as Appendix A) and resulted in meeting all water quality objectives in all but Island Creek which exceeds its objective due to the Wash Fire of 2015. No fish habitat restoration activities are planned in Island Creek which is below objective due to the 2015 Wash Fire.

Roadside fuel treatments would not affect the water quality objective because of RHCA retention and the limited number of roadside acres treated (document 11-004). Previous road decommissioning (2.2 miles) was conducted to reduce sediment delivery from roads. There are few other restoration opportunities available in Island Creek. The remaining project area watersheds meet their objectives.

Project activities will comply with design features, BMPs, and mitigation criteria to ensure compliance with Forest Plan Water Quality Criteria and relevant BMPs. The project implements BMPs to minimize or prevent sediment delivery to streams including RCHA retention and cross drain culvert additions to roads near stream crossings (document 11-004).

Modelling has been conducted using ECA (water yield). Project activities would not exceed acceptable limits. Previous cumulative effects analyses were used during the planning stages of the project to understand how this project may impact existing condition.

Cultural Resources

The Green Horse project complies with the Forest Plan standards related to cultural resources where sites within the area of potential effects have been evaluated for their National Register of Historic Places (NRHP) eligibility. Mitigation measures have been developed to protect NRHP eligible sites. There are no significant Native American religious or cultural sites within the project APE. The cultural resource surveys have been completed for the Green Horse project area, a report was submitted to the Idaho State Historic Preservation Office (SHPO) for concurrence, and it was received on December 15, 2020.

Visual Quality

All landscape-altering activities would meet adopted Forest Plan Visual Quality Objectives (VQOs). Duration of visual impacts should meet the guidelines outlined for each VQO in Agriculture Handbook No. 462-Chapter 2. The project would comply with Forest Plan forest-wide standards for visual resources in the Nez Perce National Forest Plan (USDA 1987).

Management Area 17 is located to the American River – Selway Road 443 and the Falls Creek II Road 9716. Proposed fuel break harvest would meet the VQO of Partial Retention for the areas adjacent to the roadway and meet the Forest Plan direction for MA 17.

Agencies or Persons Consulted

The Forest Service consulted the following individuals, Federal, State, tribal, and local agencies during the development of this EA:

- Nez Perce Tribe
- Idaho Department of Fish and Game
- Board of Idaho County Commissioners
- Christopher Fischer
- Lisa Eldridge
- Gary Bowling
- American Forest Resource Council
- Idaho Conservation League
- Harry Jageman
- Friends of the Clearwater
- Idaho Forest Group
- Evergreen Forest

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Appendix A

Upward Trend Analysis

The analysis of expected trend in aquatic conditions is an important component of the aquatic and watershed assessments. Nez Perce Forest Plan Appendix A addresses trends in below objective watersheds with upward trend direction. Upward trend means that stream conditions determined through analysis to be below the Forest Plan objective will move toward the objective over time. The Forest Plan did not specifically intend that the improving trend be in place prior to initiation of new activities (Conroy and Thompson 2011). Only streams that do not meet Forest Plan objectives require an upward trend analysis. The following evaluation includes upward trend assessments for Island Creek prescription watersheds.

Upward trend guidance is outlined in the “Implementation Guide to Appendix A of the Nez Perce Forest Plan” (Conroy and Thompson 2011). To assess the expected trend in aquatic conditions a variety of information and tools are used to arrive at a professional conclusion. These tools include the NEZSED and FISHSED, and ECA models that focus on sediment and water yields. Information used includes the landscape setting and channel characteristics, project proposals, existing pre-project trends, other activities within the watershed, and qualitative assessment of the effect pathways between management activities and resulting aquatic conditions. Effects analyses for all proposed actions associated with the Green Horse Project can be found in the Aquatic Species and Watershed sections of this EA.

The following is a summary of the overall aquatic conditions in the Island Creek watershed, potential trends to aquatic habitats and the processes that affect them, and the potential effects of the proposed activities in the Green Horse Project may have on those trends.

Current Condition Summary

The 3,865 acre Island Creek prescription watershed does not meet its Forest Plan sediment yield guideline of 70% based on Cobble embeddedness measures where the 55% measure of cobble embeddedness (data from 2014) Forest Plan objective of 70%. The 2015 Wash Fire burned 72% of the watershed with mixed to high severity fire. The few years after the 2015 fire marked high erosion and sediment inputs to the stream in severely burned areas. A NEZSED model output from 2015 estimated that Island Creek would be 113% above Forest Plan allowed sediment yield thresholds. However, the post-fire vegetation recovery has mitigated post-fire surface erosion. The table below summarizes resource indicator values for water quality.

Resource Element	Resource Indicator	Measure	Existing Condition (% over base)		Forest Plan Allowed
Water quality	Sediment delivery	NEZSED results for baseline sediment yield	In 2015	In 2020	30%
			113% over base	2% over base	
		RHCA road density	mi/mi ²	Desired	Road/stream crossings-haul roads
			Island- 0.1	<1 mi/mi ²	Island- 6

Island Creek has 0.9 miles of fish-bearing stream and a minimum of 10 miles of non-fish bearing streams. The main tributary stream is mostly suitable for westslope cutthroat and steelhead trout. Habitat survey

data (1989) indicated a partial fish migration barrier (falls) near the mouth of the stream that prevents fish access into the stream at most flows. Stream gradients were also high (12%) which results in few available fish bearing stream miles. Most fish bearing reaches occur in streams with gradients of less than 8%.

Past impacts include regeneration timber harvest activities on 5% of the watershed between 1981 and 1992. Intermediate harvest occurred on 2% of the area between the 1975 and 1983. Streamside buffers of 50 feet were retained on some streams. Post-fire field reviews of burned areas in the Selway, Middle Fork Clearwater, Lochsa and Lolo drainages indicates little, and generally localized, surface erosion after a fire occurs. Post fire recruitment of large woody debris into streams is actively occurring from tree mortality in riparian areas. The dead trees will provide some amount of shade to the stream both while they are standing and when they fall. There is a risk for stream temperature increases; however, the relatively small size of the stream and steep topography of the watershed will likely minimize those increases. Streambank stability may have been reduced by the fire, both as a result of streamside tree mortality and increased peak flows.

There are 6.6 miles of road in Island Creek which mostly occur on or near ridgetops. A total of 0.7 miles are within RHCAs with an associated 6 road/stream crossings. A total of 2.2 miles of road were decommissioned in the watershed. With few roads and most importantly less than a mile of road within the RHCAs, the past road decommissioning allows for an improving trend related to sediment resulting from management actions.

In summary, riparian function is trending upward for large wood, is likely static for stream temperature and streambank stability may have declined for streambank stability in the initial years after the fire but should be trending upward now.

Proposed Activity Effects to Streams

Approximately 35 acres of regeneration harvest and 32 acres of fuels treatment are proposed in the Green Horse Project for the Island Creek Drainage. Given the location and scale of activities these proposed actions will not impact Island Creek or its tributaries. Additionally, impacts of log haul from the roadside harvest will not result in levels of sedimentation that will alter or diminish water quality in Island Creek.

Summary

In summary, there are few existing management impacts in Island Creek. There is less than 1 mile of road in RHCAs, past harvest was limited to 7% of the watershed with most occurring 27 or more years ago with some retaining streamside buffers. Past road decommissioning removed about 2 miles of roads reducing potential impacts into stream channels. The 2015 wildfire had a significant impact on water quality and likely stream channel stability, but natural recovery of vegetation is occurring and surface erosion from burned slopes appears to no longer be an impact to water quality. The stream and riparian areas have all the components necessary to maintain or improve habitat conditions over time. An upward trend has been established in Island Creek in accordance with Conroy and Thompson (2011). Proposed activities from the Green Horse Project, through RHCA retention and BMP implementation, would maintain and contribute to those upward trends (document 11-004).